

# Air Cylinder: With End Lock

## Series CBA2

ø40, ø50, ø63, ø80, ø100

### How to Order

**CBA2 L**  **50**  - **150**  - **H N**

**With auto switch CDBA2 L**  **50**  - **150**  - **H N**  - **M9BW**  -

**With auto switch (Built-in magnet)**

**Mounting style**

|          |                        |
|----------|------------------------|
| <b>B</b> | Basic style            |
| <b>L</b> | Axial foot style       |
| <b>F</b> | Rod side flange style  |
| <b>G</b> | Head side flange style |
| <b>C</b> | Single clevis style    |
| <b>D</b> | Double clevis style    |
| <b>T</b> | Center trunnion style  |

**Tube material**

|            |               |
|------------|---------------|
| <b>Nil</b> | Aluminum tube |
| <b>F*</b>  | Steel tube    |

\* Types with auto switch are not available.

**Cylinder stroke (mm)**  
For more information, please refer to the next page.

**Port thread type**

|            |     |
|------------|-----|
| <b>Nil</b> | Rc  |
| <b>TN</b>  | NPT |
| <b>TF</b>  | G   |

**Lock position**

|          |                    |
|----------|--------------------|
| <b>H</b> | Head side end lock |
| <b>R</b> | Rod side end lock  |
| <b>W</b> | Double end lock    |

**Manual release type**

|          |               |
|----------|---------------|
| <b>N</b> | Non-lock type |
| <b>L</b> | Lock type     |

**Made to Order**  
For details, refer to page 383.

**Number of auto switches**

|            |          |
|------------|----------|
| <b>Nil</b> | 2 pcs.   |
| <b>S</b>   | 1 pc.    |
| <b>n</b>   | "n" pcs. |

**Auto switch**

|            |                     |
|------------|---------------------|
| <b>Nil</b> | Without auto switch |
|------------|---------------------|

**Bore size**

|            |        |
|------------|--------|
| <b>40</b>  | 40 mm  |
| <b>50</b>  | 50 mm  |
| <b>63</b>  | 63 mm  |
| <b>80</b>  | 80 mm  |
| <b>100</b> | 100 mm |

**Lock position**

|            |                          |
|------------|--------------------------|
| <b>Nil</b> | Without rod boot         |
| <b>J</b>   | Nylon tarpaulin          |
| <b>K</b>   | Heat resistant tarpaulin |

**Cylinder suffix**

|            |                 |
|------------|-----------------|
| <b>Nil</b> | Without cushion |
| <b>N</b>   | Without cushion |

**Auto switch**

\* Refer to the table below for the applicable auto switch model.

\* When more than one symbol is to be specified, indicate them in alphabetical order.

### Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.  
(Example) CDBA2L40-100-HN

### Applicable Auto Switch/Refer to pages 1263 to 1371 for further information on auto switches.

| Type  | Special function                           | Electrical entry | Indicator light | Wiring (Output)     | Load voltage  |              | Auto switch model |               | Lead wire length (m) |            |             |             |   | Pre-wired connector | Applicable load |            |   |   |     |   |   |            |
|---|--|------------------|-----------------|---------------------|---------------|--------------|-------------------|---------------|----------------------|------------|-------------|-------------|---|---------------------|-----------------|------------|---|---|-----|---|---|------------|
|   |  |                  |                 |                     | DC            | AC           | Tie-rod mounting  | Band mounting | 0.5 (Nil)            | 1 (M)      | 3 (L)       | 5 (Z)       |   |                     |                 |            |   |   |     |   |   |            |
| Solid state switch                          | —  | Grommet          | —               | 3-wire(NPN)         | 24 V          | 5 V, 12 V    | —                 | <b>M9N</b>    | —                    | ●          | ●           | ●           | ○ | ○                   | IC circuit      |            |   |   |     |   |   |            |
|   |  |                  |                 | 3-wire(PNP)         |               |              |                   | <b>M9P</b>    | —                    | ●          | ●           | ●           | ○ | ○                   |                 |            |   |   |     |   |   |            |
|   |  |                  |                 | 2-wire              | —             | 12 V         | <b>M9B</b>        | —             | ●                    | ●          | ●           | ○           | ○ |                     |                 |            |   |   |     |   |   |            |
|   |  | Terminal conduit |                 | 3-wire(NPN)         | —             | —            | 100 V, 200 V      | <b>J51</b>    | —                    | ●          | —           | ●           | ○ | —                   |                 | —          | — |   |     |   |   |            |
|   |  |                  |                 | 2-wire              |               |              |                   | <b>G39C</b>   | <b>G39</b>           | —          | —           | —           | — | —                   |                 |            |   |   |     |   |   |            |
|   |  |                  |                 | 3-wire(NPN)         | <b>K39C</b>   | <b>K39</b>   | —                 | —             | —                    | —          | —           |             |   |                     |                 |            |   |   |     |   |   |            |
|   | Diagnostic indication (2-color indication) | Grommet          | Yes             | —                   | 3-wire(NPN)   | 24 V         | 5 V, 12 V         | —             | <b>M9NW</b>          | —          | ●           | ●           | ● | ○                   | ○               | IC circuit |   |   |     |   |   |            |
|   |  |                  |                 |                     | 3-wire(NPN)   |              |                   |               | <b>M9PW</b>          | —          | ●           | ●           | ● | ○                   | ○               |            |   |   |     |   |   |            |
|   |  |                  |                 |                     | 2-wire        | —            | 12 V              | <b>M9BW</b>   | —                    | ●          | ●           | ●           | ○ | ○                   |                 |            |   |   |     |   |   |            |
|   |  | Terminal conduit |                 |                     | 3-wire(NPN)   | —            | —                 | 100 V, 200 V  | <b>M9NA</b>          | —          | ○           | ○           | ● | ○                   | ○               |            | — |   |     |   |   |            |
|   |  |                  |                 |                     | 3-wire(PNP)   |              |                   |               | <b>M9PA</b>          | —          | ○           | ○           | ● | ○                   | ○               |            |   |   |     |   |   |            |
|   |  |                  |                 |                     | 2-wire        | —            | 12 V              | <b>M9BA</b>   | —                    | ○          | ○           | ●           | ○ | ○                   |                 |            |   |   |     |   |   |            |
| Water resistant (2-color indication)        | Grommet                                    | —                | —               | 3-wire(NPN)         | 24 V          | 5 V, 12 V    | —                 | <b>M9NA</b>   | —                    | ○          | ○           | ●           | ○ | ○                   | —               |            |   |   |     |   |   |            |
|   |  |                  |                 | 3-wire(PNP)         |               |              |                   | <b>M9PA</b>   | —                    | ○          | ○           | ●           | ○ | ○                   |                 |            |   |   |     |   |   |            |
|   |  |                  |                 | 2-wire              | —             | 12 V         | <b>M9BA</b>       | —             | ○                    | ○          | ●           | ○           | ○ |                     |                 |            |   |   |     |   |   |            |
|   |  |                  |                 | 4-wire(NPN)         | —             | 5 V, 12 V    | <b>F59F</b>       | <b>G59F</b>   | ●                    | —          | ●           | ○           | ○ | IC circuit          |                 |            |   |   |     |   |   |            |
| With diagnostic output (2-color indication) | Grommet                                    | —                | —               | 2-wire (Non-polar)  | —             | —            | —                 | <b>P4DW</b>   | —                    | —          | ●           | ●           | ○ | ○                   | —               |            |   |   |     |   |   |            |
|   |  |                  |                 | 2-wire              |               |              |                   | —             | —                    | —          | —           | —           | — | —                   | —               | —          | — |   |     |   |   |            |
| Reed switch                                 | —  | Grommet          | Yes             | 3-wire (NPN equiv.) | 24 V          | 5 V          | —                 | <b>A96</b>    | —                    | ●          | —           | ●           | — | —                   | IC circuit      | —          |   |   |     |   |   |            |
|   |  |                  |                 | 2-wire              |               |              |                   | —             | 100 V                | <b>A93</b> | —           | ●           | — | ●                   | —               |            | — | — |     |   |   |            |
|   |  |                  |                 | Terminal conduit    | 100 V or less | <b>A90</b>   | —                 | ●             | —                    | ●          | —           | —           | — | —                   | IC circuit      |            |   |   |     |   |   |            |
|   |  |                  |                 |                     | 100 V, 200 V  | <b>A54</b>   | <b>B54</b>        | ●             | —                    | ●          | ●           | —           | — | —                   |                 |            |   |   |     |   |   |            |
|   |  |                  |                 |                     | 200 V or less | <b>A64</b>   | <b>B64</b>        | ●             | —                    | ●          | —           | —           | — | —                   |                 |            |   |   |     |   |   |            |
|   |  | DIN terminal     |                 | Yes                 | —             | 100 V, 200 V | —                 | <b>A33C</b>   | <b>A33</b>           | —          | —           | —           | — | —                   | —               |            | — |   |     |   |   |            |
|   |  |                  |                 |                     |               |              | —                 | <b>A34C</b>   | <b>A34</b>           | —          | —           | —           | — | —                   | —               |            |   |   |     |   |   |            |
|   |  | Grommet          |                 | —                   | —             | —            | —                 | —             | —                    | —          | <b>A44C</b> | <b>A44</b>  | — | —                   | —               |            | — | — | PLC |   |   |            |
|   |  |                  |                 |                     |               |              |                   |               |                      |            | <b>A59W</b> | <b>B59W</b> | ● | —                   | ●               |            | — | — |     | — | — | Relay, PLC |
|   |  |                  |                 |                     |               |              |                   |               |                      |            | —           | —           | — | —                   | —               |            | — | — |     | — | — |            |

\* Lead wire length symbols: 0.5m..... Nil (Example)M9NW  
 1m..... M (Example)M9NWM  
 3m..... L (Example)M9NWL  
 5m..... Z (Example)M9NWZ

\* Solid state auto switches marked with "○" are produced upon receipt of order.

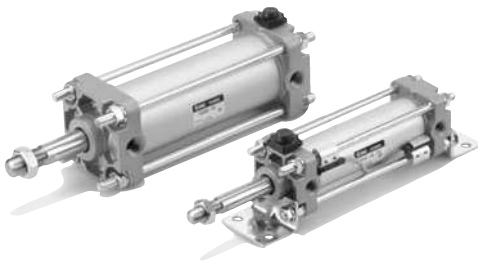
\* In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 406.  
 \* Refer to pages 1328 and 1329 for the details about auto switches with a pre-wired connector.  
 \* D-A9□/M9□/M9□W/M9□AL auto switches are shipped together (not assembled). (However, auto switch mounting brackets are assembled when being shipped.)

**Maintains the cylinder's original position even if the air supply is interrupted.**

When air is discharged at the stroke end position, the lock engages to maintain the rod in that position.

**Same dimensions as those of the standard cylinder (Series CA2)**

**Non-lock and lock types are standard for manual release.**



## Specifications

| Bore size (mm)                | 40  | 50 | 63 | 80 | 100 |
|-------------------------------|---|----|----|----|-----|
| Fluid                         | Air   |    |    |    |     |
| Proof pressure                | 1.5 MPa   |    |    |    |     |
| Maximum operating pressure    | 1.0 MPa   |    |    |    |     |
| Minimum operating pressure    | 0.15 MPa*   |    |    |    |     |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (With no freezing)<br>With auto switch: -10 to 60°C (With no freezing)                                       |    |    |    |     |
| Piston speed                  | 50 to 500 mm/s  |    |    |    |     |
| Cushion                       | Interchangeable   |    |    |    |     |
| Stroke length tolerance       | To 250 <sup>st</sup> ± 0.10 251 to 1000 <sup>st</sup> ± 0.14 1001 to 1500 <sup>st</sup> ± 0.18  |    |    |    |     |
| Lubrication                   | Not required (Non-lube)   |    |    |    |     |
| Mounting                      | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style |    |    |    |     |

\* 0.05 MPa except locking parts.

## Lock Specifications

| Lock position            | Head side end, Rod side end, Double end |      |      |      |      |
|--------------------------|---|------|------|------|------|
|                          | ø40                                     | ø50  | ø63  | ø80  | ø100 |
| Holding force (Max.) (N) | 860                                     | 1340 | 2140 | 3450 | 5390 |
| Backlash                 | 2 mm or less                            |      |      |      |      |
| Manual release           | Non-lock type, Lock type                |      |      |      |      |

**Accessory**/For more information, refer to page 367.

**Made to Order** Made to Order Specifications  
(For details, refer to pages 1373 to 1498.)

| Symbol   | Specifications  |
|----------|---|
| -XA □    | Change of rod end shape   |
| -XB6     | Heat resistant (150°C)  |
| -XC3     | Special port position   |
| -XC4 *1  | With heavy duty scraper   |
| -XC6 *1  | Piston rod, rod end nut made of stainless steel                   |
| -XC7     | Tie-rod, cushion valve, tie rod nut, etc. made of stainless steel |
| -XC8 *1  | Adjustable stroke/Extension adjustment                            |
| -XC9 *2  | Adjustable stroke/Retraction adjustment                           |
| -XC10    | Dual stroke/Double rod  |
| -XC14    | Change of trunnion bracket mounting position                      |
| -XC15    | Change of tie-rod length  |
| -XC22    | Fluororubber seal   |
| -XC27    | Double clevis pin and double knuckle pin made of stainless steel  |
| -XC28    | Compact flange made of SS400                                      |
| -XC29    | Double knuckle joint with spring pin                              |
| -XC35 *1 | With coil scraper   |

\*1: For head side end lock type only

\*2: For rod side end lock type only

Refer to pages 401 to 406 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Switch mounting bracket: Part no.

| Accessory              | Standard    |            |                                 | Option               |                                 |          |
|------------------------|-------------|------------|---------------------------------|----------------------|---------------------------------|----------|
|                        | Rod end nut | Clevis pin | Lock release bolt (N type only) | Single knuckle joint | Double knuckle joint (With pin) | Rod boot |
| Mounting               |             |            |                                 |                      |                                 |          |
| Basic style            | ●           | —          | ●                               | ●                    | ●                               | ●        |
| Axial foot style       | ●           | —          | ●                               | ●                    | ●                               | ●        |
| Rod side flange style  | ●           | —          | ●                               | ●                    | ●                               | ●        |
| Head side flange style | ●           | —          | ●                               | ●                    | ●                               | ●        |
| Single clevis style    | ●           | —          | ●                               | ●                    | ●                               | ●        |
| Double clevis style*   | ●           | ●          | ●                               | ●                    | ●                               | ●        |
| Center trunnion style  | ●           | —          | ●                               | ●                    | ●                               | ●        |

\* Double clevis and double knuckle joint types are packed with pin, cotter pin and flat washer.

## Standard Stroke

| Bore size (mm) | Standard stroke (mm)  |
|----------------|---|
| 40             | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500           |
| 50, 63         | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600      |
| 80, 100        | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700 |

\* Types with auto switch have different minimum strokes. Please refer to pages 403 and 404.

## Rod Boot Material

| Symbol | Rod boot materials       | Max. ambient temperature |
|--------|--------------------------|--------------------------|
| J      | Nylon tarpaulin          | 70°C                     |
| K      | Heat resistant tarpaulin | 110°C*                   |

\* Maximum ambient temperature for the rod boot itself.

## Minimum Stroke for Auto Switch Mounting

### ⚠ Caution

1. The minimum stroke for mounting varies with the auto switch type and mounting style of the cylinder. In particular, the center trunnion style needs careful attention. (For more information, please refer to pages 403 and 404.)

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

CS2

D-□

-X□

Individual  
-X□

Technical  
data

# Series CBA2

## Mass/Aluminum Tube (Steel tube)

| Bore size (mm)                        |  | 40             | 50             | 63             | 80             | 100            |
|---------------------------------------|--|----------------|----------------|----------------|----------------|----------------|
| Basic mass                            | Basic style  | 0.89<br>(0.94) | 1.36<br>(1.40) | 2.00<br>(2.04) | 3.48<br>(3.63) | 4.87<br>(5.07) |
|                                       | Axial foot style                                   | 1.08<br>(1.13) | 1.58<br>(1.62) | 2.34<br>(2.38) | 4.15<br>(4.30) | 5.86<br>(6.06) |
|                                       | Flange style                                       | 1.26<br>(1.30) | 1.81<br>(1.86) | 2.79<br>(2.84) | 4.93<br>(5.08) | 6.79<br>(6.99) |
|                                       | Single clevis style                                | 1.12<br>(1.17) | 1.70<br>(1.74) | 2.63<br>(2.67) | 4.59<br>(4.74) | 6.65<br>(6.86) |
|                                       | Double clevis style                                | 1.16<br>(1.21) | 1.79<br>(1.84) | 2.79<br>(2.83) | 4.88<br>(5.03) | 7.17<br>(7.38) |
|                                       | Trunnion style                                     | 1.25<br>(1.35) | 1.84<br>(1.94) | 2.80<br>(3.00) | 5.03<br>(5.32) | 7.15<br>(7.54) |
| Additional mass per each 50 mm stroke | All mounting brackets (Except steel tube trunnion) | 0.22<br>(0.28) | 0.28<br>(0.35) | 0.37<br>(0.43) | 0.52<br>(0.70) | 0.65<br>(0.87) |
|                                       | Steel tube trunnion                                | (0.36)         | (0.46)         | (0.65)         | (0.86)         | (1.07)         |
| Accessory                             | Single knuckle                                     | 0.23           | 0.26           | 0.26           | 0.60           | 0.83           |
|                                       | Double knuckle (With pin)                          | 0.37           | 0.43           | 0.43           | 0.87           | 1.27           |

\* Values inside the parentheses are those for the steel tube type.

## Lock Unit Additional Mass

| Bore size (mm)                   |                        | 40   | 50   | 63   | 80   | 100  |
|----------------------------------|------------------------|------|------|------|------|------|
| Manual release Non-lock type (N) | Head side end lock (H) | 0.02 | 0.03 | 0.03 | 0.10 | 0.12 |
|                                  | Rod side end lock (R)  | 0.02 | 0.02 | 0.02 | 0.07 | 0.06 |
|                                  | Double end lock (W)    | 0.04 | 0.05 | 0.05 | 0.17 | 0.18 |
| Manual release lock type (L)     | Head side end lock (H) | 0.04 | 0.05 | 0.05 | 0.13 | 0.15 |
|                                  | Rod side end lock (R)  | 0.04 | 0.04 | 0.04 | 0.10 | 0.09 |
|                                  | Double end lock (W)    | 0.08 | 0.09 | 0.09 | 0.23 | 0.24 |

Calculation: (Example) **CBA2L40-100-HN**

• Basic mass ..... 1.08kg (ø40 Axial foot style)

• Additional mass ..... 0.22/50<sup>st</sup>

• Cylinder stroke ..... 100<sup>st</sup>

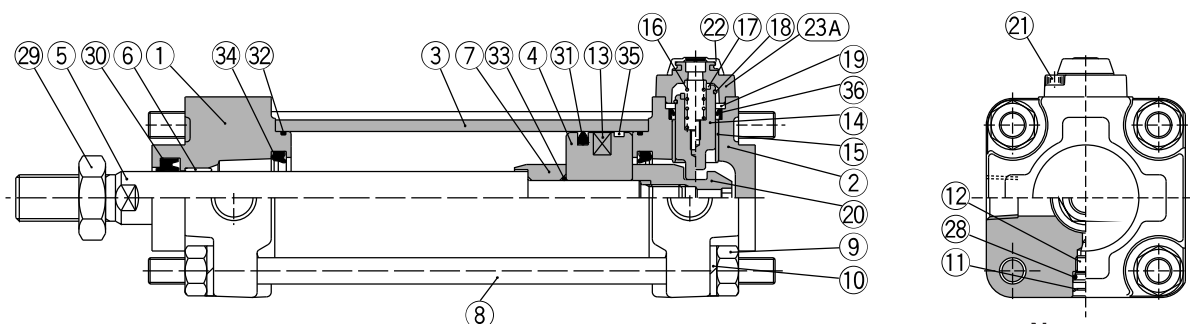
• Lock mass ..... 0.02 kg

(Head side end lock, Manual release, Non-lock)

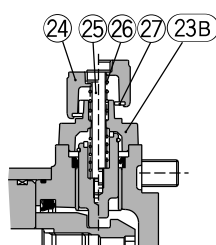
$1.08 + 0.22 \times 100/50 + 0.02 = 1.54$  kg

## Construction

### Head side end lock



Manual release non-lock type: Suffix N



Manual release lock type: Suffix L

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

**CA2**

CS1

CS2

### Component Parts

| No. | Description                   | Material                  | Note                              |
|-----|-------------------------------|---------------------------|-----------------------------------|
| 1   | Rod cover                     | Aluminum die-casted       | Metallic painted                  |
| 2   | Head cover                    | Aluminum die-casted       | Metallic painted                  |
| 3   | Cylinder tube                 | Aluminum alloy            | Hard anodized                     |
| 4   | Piston                        | Aluminum alloy            | Chromated                         |
| 5   | Piston rod                    | Carbon steel              | Hard chromium electroplated       |
| 6   | Bushing                       | Lead-bronze casted        |                                   |
| 7   | Cushion ring A                | Rolled steel              | Electroless nickel plated         |
| 8   | Tie-rod                       | Carbon steel              | Zinc chromated                    |
| 9   | Tie-rod nut                   | Rolled steel              | Nickel plated                     |
| 10  | Spring washer                 | Steel wire                | Chromated                         |
| 11  | Retaining ring                | Spring steel              |                                   |
| 12  | Cushion valve                 | Steel wire                | Nickel plated                     |
| 13  | Magnet*                       | —                         | With auto switch*                 |
| 14  | Lock piston                   | Carbon steel              | Quench hard chrome plated         |
| 15  | Lock bushing                  | Lead-bronze casted        |                                   |
| 16  | Lock spring                   | Stainless steel           |                                   |
| 17  | Bumper                        | Urethane                  |                                   |
| 18  | C-ring                        | Steel wire                | Zinc chromated                    |
| 19  | Seal retainer                 | Rolled steel              | Zinc chromated                    |
| 20  | Cushion ring nut              | Chromium molybdenum steel | Quench, Electroless nickel plated |
| 21  | Hexagon socket head cap screw | Chromium molybdenum steel | Black zinc chromated              |
| 22  | Rubber cap                    | Chloroprene rubber        |                                   |
| 23A | Cap A                         | Aluminum casted           | Black coated                      |
| 23B | Cap B                         | Carbon steel              | Oxide film treated                |

| No. | Description          | Material                  | Note                              |
|-----|----------------------|---------------------------|-----------------------------------|
| 24  | M/O knob             | Zinc die-casted           | Black coated                      |
| 25  | M/O bolt             | Chromium molybdenum steel | Black zinc chromated, Red painted |
| 26  | M/O spring           | Steel wire                | Zinc chromated                    |
| 27  | Stopper ring         | Carbon steel              | Zinc chromated                    |
| 28  | Cushion valve seal   | NBR                       |                                   |
| 29  | Rod end nut          | Rolled steel              | Nickel plated                     |
| 30  | Rod seal             | NBR                       |                                   |
| 31  | Piston seal          | NBR                       |                                   |
| 32  | Cylinder tube gasket | NBR                       |                                   |
| 33  | Piston gasket        | NBR                       |                                   |
| 34  | Cushion seal         | NBR                       |                                   |
| 35  | Wear ring            | Resin                     |                                   |
| 36  | Lock piston seal     | NBR                       |                                   |

### Replacement Parts: Seal Kit

| Bore size (mm) | Seal kit no.    |                 | Content                               |
|----------------|-----------------|-----------------|---------------------------------------|
|                | Single end lock | Double end lock |                                       |
| 40             | MBB40-PS        | MBB40-PS-W      | Set of nos. above 30, 31, 32, 34, 36. |
| 50             | MBB50-PS        | MBB50-PS-W      |                                       |
| 63             | MBB63-PS        | MBB63-PS-W      |                                       |
| 80             | MBB80-PS        | MBB80-PS-W      |                                       |
| 100            | MBB100-PS       | MBB100-PS-W     |                                       |

\* Seal kit includes 30, 31, 32, 34 and 36. Order the seal kit based on each bore size.

\* Do not disassemble the trunnion style. Refer to page 407.

\* Seal kit includes a grease pack (ø40, 50: 10 g, ø63, 80: 20 g, ø100: 30 g). Order with the following part number when only the grease pack is needed.  
**Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)**

D-□

-X□

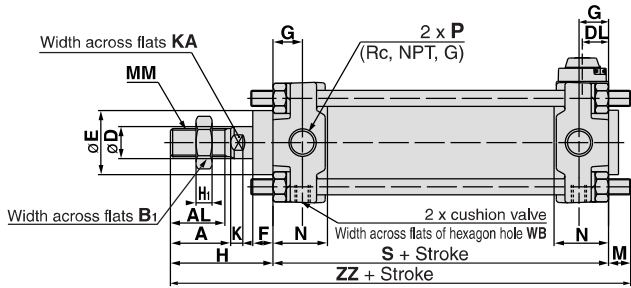
Individual  
-X□

Technical  
data

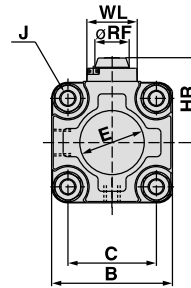
# Series CBA2

## Basic Style (Dimensions are common to rear end lock, front end lock and double end lock types.)

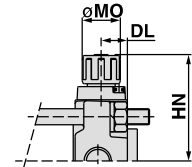
### Head side end lock: CBA2B Bore size – Stroke -HN



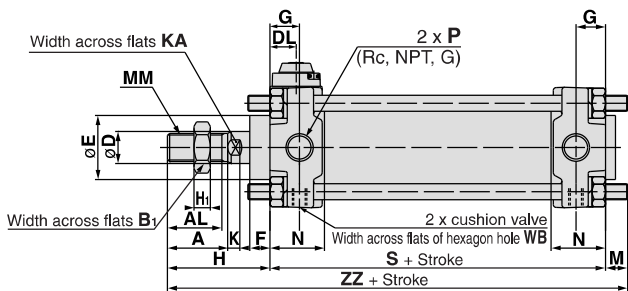
Manual release (Non-lock type):  
Suffix N



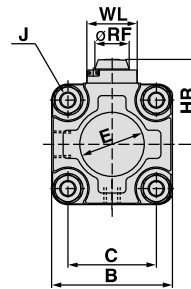
Manual release (Non-lock type):  
Suffix L



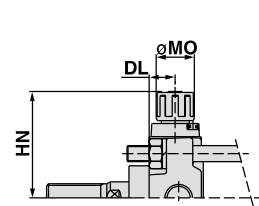
### Rod side end lock: CBA2B Bore size – Stroke -RN



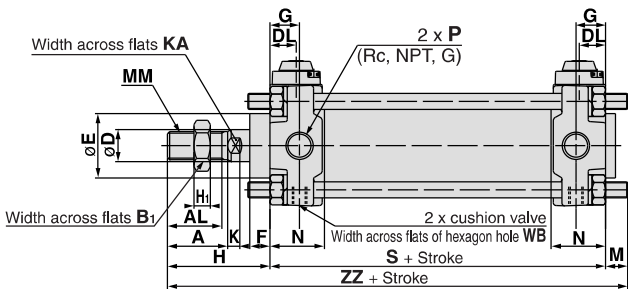
Manual release (Non-lock type):  
Suffix N



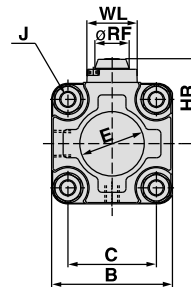
Manual release (Lock type):  
Suffix L



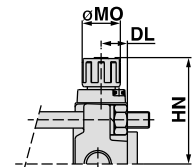
### Double lock: CBA2B Bore size – Stroke -WN



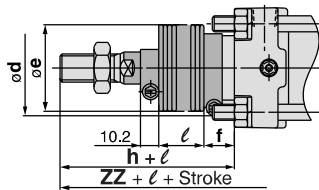
Manual release (Non-lock type):  
Suffix N



Manual release (Lock type):  
Suffix L



### With rod boot



| Bore size (mm) | Stroke range | A  | AL | B   | B <sub>1</sub> | C  | D  | DL   | E  | F  | G  | H  | H <sub>1</sub> | HR   | HN (MAX) | J          | K  | KA | M  | MM        | MO | N  | P   | RF | S   | WB  | WL | ZZ  |
|----------------|--------------|----|----|-----|----------------|----|----|------|----|----|----|----|----------------|------|----------|------------|----|----|----|-----------|----|----|-----|----|-----|-----|----|-----|
| 40             | Up to 500    | 30 | 27 | 60  | 22             | 44 | 16 | 13   | 32 | 10 | 15 | 51 | 8              | 42.3 | 56       | M8 x 1.25  | 6  | 14 | 11 | M14 x 1.5 | 19 | 27 | 1/4 | 17 | 84  | 2.5 | 25 | 146 |
| 50             | Up to 600    | 35 | 32 | 70  | 27             | 52 | 20 | 13   | 40 | 12 | 17 | 58 | 11             | 47.3 | 61       | M8 x 1.25  | 7  | 18 | 11 | M18 x 1.5 | 19 | 30 | 3/8 | 17 | 90  | 2.5 | 25 | 159 |
| 63             | Up to 600    | 35 | 32 | 85  | 27             | 64 | 20 | 15.5 | 40 | 10 | 17 | 58 | 11             | 54.8 | 68.5     | M10 x 1.25 | 7  | 18 | 14 | M18 x 1.5 | 19 | 31 | 3/8 | 17 | 98  | 4   | 25 | 170 |
| 80             | Up to 750    | 40 | 37 | 102 | 32             | 78 | 25 | 18.5 | 52 | 14 | 21 | 71 | 13             | 65.8 | 80.5     | M12 x 1.75 | 11 | 22 | 17 | M22 x 1.5 | 23 | 37 | 1/2 | 21 | 116 | 4   | 40 | 204 |
| 100            | Up to 750    | 40 | 37 | 116 | 41             | 92 | 30 | 20   | 52 | 14 | 21 | 72 | 16             | 72.8 | 87.5     | M12 x 1.75 | 11 | 26 | 17 | M26 x 1.5 | 23 | 40 | 1/2 | 21 | 126 | 4   | 40 | 215 |

\* For more information about the rod end nut and accessories, refer to page 367.

### With Rod Boot

| Bore size (mm) | Stroke range (mm) | d  | e  | f    | h  | ℓ          | ZZ  |
|----------------|-------------------|----|----|------|----|------------|-----|
| 40             | 20 to 500         | 56 | 43 | 11.2 | 59 | 1/4 stroke | 154 |
| 50             | 20 to 600         | 64 | 52 | 11.2 | 66 | 1/4 stroke | 167 |
| 63             | 20 to 600         | 64 | 52 | 11.2 | 66 | 1/4 stroke | 178 |
| 80             | 20 to 750         | 76 | 65 | 12.5 | 80 | 1/4 stroke | 213 |
| 100            | 20 to 750         | 76 | 65 | 14   | 81 | 1/4 stroke | 224 |

Dimensions of the mounting brackets are the same as those of the standard double acting single rod type. Refer to pages 361 to 365.



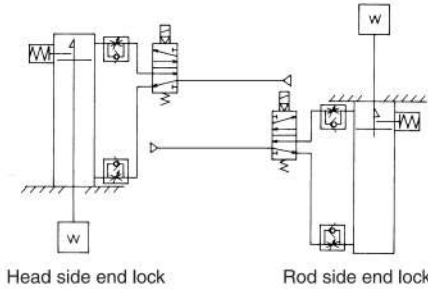
# Series CBA2 Specific Product Precautions

Be sure to read before handling.  
Refer to front matters 54 and 55 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

## Use the Recommended Pneumatic Circuit.

### ⚠ Caution

They are required to engage and disengage the locks correctly.



## Operation

### ⚠ Caution

- Do not use a 3 position solenoid valve.**  
Avoid using this cylinder in combination with a 3 position solenoid valve (particularly the closed center metal seal type). If air pressure becomes sealed inside the port on the side that contains the lock mechanism, the lock will not engage. Even if the lock is engaged at first, the air that leaks from the solenoid valve could enter the cylinder and cause the lock to disengage as time elapses.
- Back pressure is required when releasing the lock.**  
Before starting, make sure that air is supplied to the side that is not equipped with a lock mechanism as shown in the diagram above (or the side on which the piston rod is unlocked, if both sides are equipped with a lock). Otherwise, the lock may not disengage.
- Release the lock when mounting or adjusting the cylinder.**  
The lock may not disengage if the cylinder is installed with its lock engaged.
- Operate with a load ratio of 50% or less.**  
The lock may not disengage or may become damaged if the load exceeds 50%.
- Do not operate multiple synchronized cylinders.**  
Avoid applications in which two or more end lock cylinders are synchronized to move one work piece, as one of the cylinder locks may not be disengaged when required.
- Use a speed controller with meter-out control.**  
If operated under meter-in control, the lock may not disengage.
- Be sure to operate completely to the cylinder stroke end on the side with the lock.**  
The lock may not engage or disengage if the piston in the cylinder has not reached the stroke end.

## Operating Pressure

### ⚠ Caution

- Supply air pressure of 0.15 MPa or higher to the port on the side that has the lock mechanism, as it is necessary for disengaging the lock.

## Exhaust Speed

### ⚠ Caution

- When the pressure on the side with the lock mechanism drops to 0.05 MPa or below, the lock engages automatically. If the piping on the side with the lock mechanism is thin and long, or if the speed controller is away from the cylinder port, the lock engagement may take some due to decline of the exhaust speed. The same result will be caused by clogging of the silencer installed at the EXH port of the solenoid valve.

## Relation to Cushion

### ⚠ Caution

- When the cushion valve on the side with the lock mechanism is fully closed or almost closed, the piston rod may not be able to reach the stroke end, resulting in lock engagement failure. Furthermore, if the lock becomes engaged while the cushion valve is almost fully closed, it may become impossible to be disengaged. Therefore, the cushion valve must be adjusted properly.

## Releasing the Lock

### ⚠ Caution

- To disengage the lock, make sure to supply air pressure to the port on the side without a lock mechanism, thus preventing the load from being applied to the lock mechanism. (Refer to the recommended air pressure circuit.) If the lock is disengaged, while the port on the side without a lock mechanism is in the exhausted state and the load is being applied to the lock mechanism, undue force may be applied to the lock mechanism, causing the lock mechanism to be damaged. Also, it could be extremely dangerous, because the piston rod could move suddenly.

## Manual Release

### ⚠ Caution

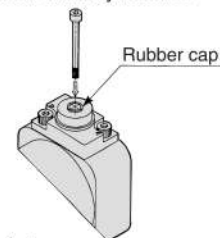
#### 1. Non-lock type manual release

Insert the bolt, which is provided as an accessory part, through the rubber cap (it is not necessary to remove the rubber cap). Screw the bolt into the lock piston and pull the bolt to disengage the lock. Releasing the bolt will re-engage the lock.

The bolt size, pulling force, and the stroke are listed below.

| Bore size (mm) | Thread size            | Pulling force | Stroke (mm) |
|----------------|------------------------|---------------|-------------|
| 40, 50, 63     | M3 x 0.5 x 30ℓ or more | 10 N          | 3           |
| 80, 100        | M5 x 0.8 x 40ℓ or more | 24.5 N        | 3           |

- \* Remove the bolt for normal operation.
- \* It can cause lock malfunction or faulty release.

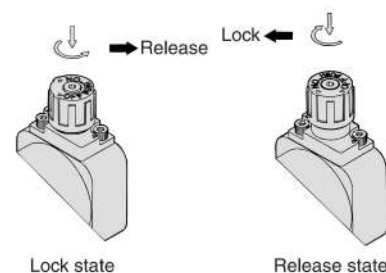


#### 2. Manual release lock type

Push the M/O knob and turn it 90° counterclockwise. The lock disengages when the ▲ mark on the cap is aligned with the ▼ OFF mark on the M/O knob (and the lock will remain disengaged).

To engage the lock, push the M/O knob all the way in and turn it 90° clockwise to align the ▲ mark on the cap with the ▼ ON mark on the M/O knob. At this time, make sure that the knob stops by clicking into place.

Failure to click it into place properly can cause the lock to disengage.



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

CS2

D-□

-X□

Individual  
-X□

Technical  
data