

# Air Cylinder: Non-rotating Rod Type Double Acting

## Series **CG1K**

Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63

### How to Order

**Type**

|   |                                 |
|---|---------------------------------|
| N | Rubber bumper                   |
| A | Air cushion (Ø 40 to Ø 63 only) |

**Cylinder stroke [mm]**  
Refer to "Standard Strokes" on page 39.

**Pivot bracket**

|   |   |
|---|---|
| — | None  |
| N | Pivot bracket is shipped together with the product. |

\* Only for D, U, T mounting types  
\* Pivot bracket is shipped together with the product, but not assembled.

**With auto switch** **CG1K** **B** **N** **25** - **100** **Z** - **—** **—** **—**

**With auto switch (Built-in magnet)** **CDG1K** **B** **N** **25** - **100** **Z** - **—** **—** **M9BW** **—** **—**

**Double acting, Non-rotating rod type**

**Mounting**

|    |   |   |               |
|----|---|---|---------------|
| B  | Basic   | G | Head flange   |
| Z* | Basic (without trunnion mounting female thread) | U | Rod trunnion  |
| L  | Axial foot                                      | T | Head trunnion |
| F  | Rod flange                                      | D | Clevis        |

**Bore size**

|    |       |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |
| 50 | 50 mm |
| 63 | 63 mm |

**Rod end bracket**

|   |                      |
|---|----------------------|
| — | None                 |
| V | Single knuckle joint |
| W | Double knuckle joint |

\* No bracket is provided for the female rod end.  
\* Rod end bracket is shipped together with the product, but not assembled.  
\* A knuckle joint pin is not provided with the single knuckle joint.

**Number of auto switches**

|   |          |
|---|----------|
| — | 2 pcs.   |
| S | 1 pc.    |
| n | "n" pcs. |

**Auto switch**

|   |                     |
|---|---------------------|
| — | Without auto switch |
|---|---------------------|

\* For applicable auto switches, refer to the table below.

**Rod end thread**

|   |                |
|---|----------------|
| — | Male rod end   |
| F | Female rod end |

**Made to Order**  
For details, refer to page 39.

Note) Mounting bracket is shipped together with the product, but not assembled.  
\* The cylinder for F, G, L, D mounting types is Z: Basic (without trunnion mounting female thread).

### 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) CDG1KFA32-100Z

**Applicable Auto Switches**/Refer to the **Auto Switches Guide** 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        | Applicable bore size |         | 0.5<br>(—)           | 1<br>(M) | 3<br>(L) | 5<br>(Z)   | None<br>(N) |                     |                 |            |            |   |
|                         |   |   |                 |                        |              |           | ø 20 to ø 63         |         |                      |          |          |            |             |                     |                 |            |            |   |
|                         |   |   |                 |                        |              |           | Perpendicular        | In-line |                      |          |          |            |             |                     |                 |            |            |   |
| Solid state auto switch | —   | Grommet                                     | Yes             | 3-wire (NPN)           | 24 V         | 5 V, 12 V | —                    | M9NV    | M9N                  | ●        | ●        | ●          | ○           | —                   | ○               | IC circuit | Relay, PLC |   |
|                         |   | 3-wire (PNP)                                |                 | M9PV                   |              |           |                      | M9P     | ●                    | ●        | ●        | ○          | —           | ○                   |                 |            |            |   |
|                         | Connector                                   | 2-wire                                      |                 | 12 V                   |              |           |                      | M9BV    | M9B                  | ●        | ●        | ●          | ○           | —                   | ○               |            |            | — |
|                         |   | —   |                 | H7C                    |              |           |                      | ●       | —                    | ●        | ●        | ●          | —           | —                   |                 |            |            |   |
|                         | Diagnostic indication (2-colour indication) | Grommet                                     |                 | 3-wire (NPN)           | 24 V         | 5 V, 12 V | —                    | M9NWV   | M9NW                 | ●        | ●        | ●          | ○           | —                   | ○               | IC circuit |            |   |
|                         |   |   |                 | 3-wire (PNP)           |              |           |                      | M9PWV   | M9PW                 | ●        | ●        | ●          | ○           | —                   | ○               |            |            |   |
|                         | 2-wire                                      |   |                 | M9BWV                  |              |           |                      | M9BW    | ●                    | ●        | ●        | ○          | —           | ○                   | —               |            |            |   |
|                         | 3-wire (NPN)                                |   |                 | M9NAV**                |              |           |                      | M9NA**  | ○                    | ○        | ●        | ○          | —           | ○                   | IC circuit      |            |            |   |
|                         | 3-wire (PNP)                                |   |                 | M9PAV**                | M9PA**       | ○         | ○                    | ●       | ○                    | —        | ○        |            |             |                     |                 |            |            |   |
|                         | 2-wire                                      |   |                 | M9BAV**                | M9BA**       | ○         | ○                    | ●       | ○                    | —        | ○        | —          |             |                     |                 |            |            |   |
|                         | 2-wire                                      |   |                 | —                      | H7NF         | ●         | —                    | ●       | ○                    | —        | ○        | IC circuit |             |                     |                 |            |            |   |
|                         | Diagnostic output (2-colour indication)     |   |                 | 4-wire (NPN)           | 5 V, 12 V    | —         | —                    | —       | —                    | —        | —        | —          | —           | —                   | —               | —          |            |   |
| Reed auto switch        | —   | Grommet                                     | Yes             | 3-wire (Equiv. to NPN) | 24 V         | 5 V       | —                    | A96V    | A96                  | ●        | —        | ●          | —           | —                   | —               | IC circuit | Relay, PLC |   |
|                         |   |   |                 | —                      |              |           |                      | A93V    | A93                  | ●        | —        | ●          | ●           | —                   | —               | —          |            |   |
|                         |   |   |                 | 100 V or less          |              |           |                      | A90V    | A90                  | ●        | —        | ●          | —           | —                   | —               | —          |            |   |
|                         |   |   |                 | 100 V, 200 V           |              |           |                      | —       | B54                  | ●        | —        | ●          | ●           | —                   | —               | —          |            |   |
|                         | Connector                                   | 200 V or less                               |                 | —                      | B64          | ●         | —                    | ●       | —                    | —        | —        | —          | —           |                     |                 |            |            |   |
|                         |   | —   |                 | —                      | C73C         | ●         | —                    | ●       | ●                    | ●        | —        | —          |             |                     |                 |            |            |   |
|                         |   | 24 V or less                                |                 | —                      | C80C         | ●         | —                    | ●       | ●                    | ●        | —        | —          | IC circuit  |                     |                 |            |            |   |
|                         |   | Diagnostic indication (2-colour indication) |                 | Grommet                | Yes          | —         | —                    | —       | —                    | B59W     | ●        | —          | ●           | —                   | —               | —          |            | — |

\*\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Please consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m..... — (Example) M9NW  
1 m..... M (Example) M9NWM  
3 m..... L (Example) M9NWL  
5 m..... Z (Example) M9NWZ  
None..... N (Example) H7CN

\* Since there are other applicable auto switches than listed above, refer to page 74 for details.

\* For details about auto switches with pre-wired connector, refer to the **Auto Switch Guide**.

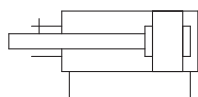
\* The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

# Series CG1K

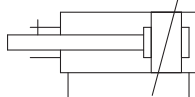


## Symbol

Rubber bumper



Air cushion



## Made to Order

(For details, refer to pages 77 to 93.)

| Symbol | Specifications  |
|--------|---|
| -XA□   | Change of rod end shape   |
| -XC8   | Adjustable stroke cylinder/Adjustable extension type*1              |
| -XC9   | Adjustable stroke cylinder/Adjustable retraction type*1             |
| -XC10  | Dual stroke cylinder/Double rod type                                |
| -XC11  | Dual stroke cylinder/Single rod type*1                              |
| -XC12  | Tandem cylinder*1, *2   |
| -XC13  | Auto switch rail mounting*1   |
| -XC20  | Head cover axial port*1   |
| -XC27  | Double clevis and double knuckle joint pins made of stainless steel |

\*1 Only compatible with cylinders with rubber bumper.

\*2 The shape is the same as the existing product.  
Use the existing seal kit.

Refer to pages 68 to 74 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range
- Cylinder mounting bracket, by stroke/  
Auto switch mounting surfaces

## Specifications

| Bore size [mm]                             | 20  | 25 | 32    | 40 | 50    | 63 |
|--|---|----|-------|----|-------|----|
| Action                                     | Double acting, Single rod   |    |       |    |       |    |
| Lubricant                                  | Not required (Non-lube)   |    |       |    |       |    |
| Fluid                                      | Air   |    |       |    |       |    |
| Proof pressure                             | 1.5 MPa   |    |       |    |       |    |
| Maximum operating pressure                 | 1.0 MPa   |    |       |    |       |    |
| Minimum operating pressure                 | 0.05 MPa  |    |       |    |       |    |
| Ambient and fluid temperature              | Without auto switch: -10 °C to 70 °C<br>With auto switch : -10 °C to 60 °C (No freezing)  |    |       |    |       |    |
| Piston speed                               | 50 to 500 mm/s  |    |       |    |       |    |
| Stroke length tolerance                    | Up to 1000 st <sup>+1.4</sup> <sub>0</sub> mm, Up to 1500 st <sup>+1.8</sup> <sub>0</sub> mm  |    |       |    |       |    |
| Cushion                                    | Rubber bumper, Air cushion (ø 40 to ø 63 only)  |    |       |    |       |    |
| Rod non-rotating accuracy <sup>Note)</sup> | ±1°   |    | ±0.8° |    | ±0.5° |    |
| Mounting                                   | Basic, Basic (without trunnion mounting female thread), Axial foot, Rod flange, Head flange, Rod trunnion, Head trunnion, Clevis (used for changing the port location by 90°) |    |       |    |       |    |

Note) The values are for standard strokes.

## Accessories

| Mounting |                                     | Basic | Axial foot | Rod flange | Head flange | Rod trunnion | Head trunnion | Clevis |
|----------|-------------------------------------|-------|------------|------------|-------------|--------------|---------------|--------|
| Standard | Rod end nut                         | ●     | ●          | ●          | ●           | ●            | ●             | ●      |
|          | Clevis pin                          | —     | —          | —          | —           | —            | —             | ●      |
| Option   | Single knuckle joint                | ●     | ●          | ●          | ●           | ●            | ●             | ●      |
|          | Double knuckle joint*<br>(With pin) | ●     | ●          | ●          | ●           | ●            | ●             | ●      |
|          | Pivot bracket                       | —     | —          | —          | —           | ●            | ●             | ●      |

\* A double knuckle joint pin and retaining rings are shipped together.

## Standard Strokes

| Bore size | Standard stroke <sup>Note 1)</sup>       | Maximum manufacturable stroke <sup>Note 2)</sup> |
|-----------|--|--|
| 20        | 25, 50, 75, 100, 125, 150, 200           | 201 to 1500                                      |
| 25        | 25, 50, 75, 100, 125, 150, 200, 250, 300 | 301 to 1500                                      |
| 32        |  |  |
| 40        |  |  |
| 50, 63    |  |  |

Note 1) Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)  
Note 2) The maximum manufacturable stroke shows the long stroke.

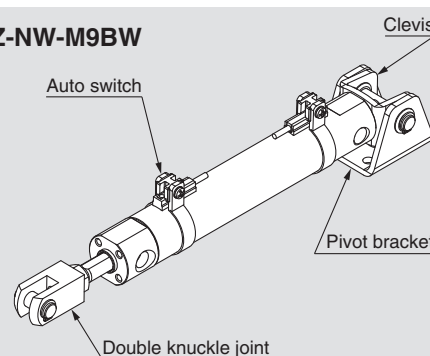
Note 3) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection". In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

## Ordering Example of Cylinder Assembly

Cylinder model: CDG1KDN20-100Z-NW-M9BW

Mounting D: Clevis  
Pivot bracket N: Yes  
Rod end bracket W: Double knuckle joint  
Auto switch D-M9BW: 2 pcs.

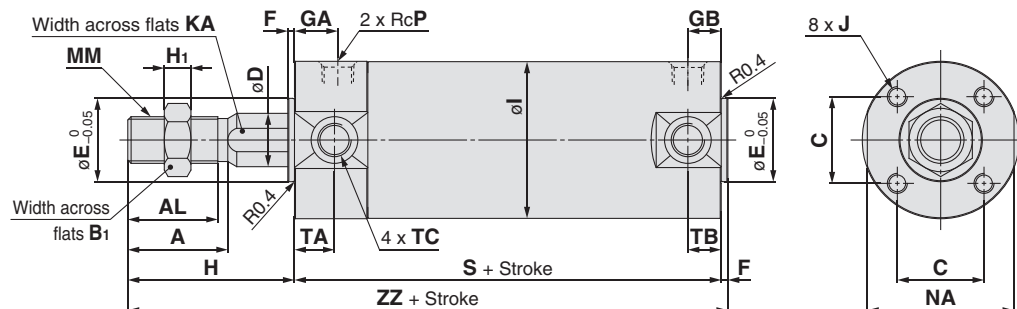
\*Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.



## Basic

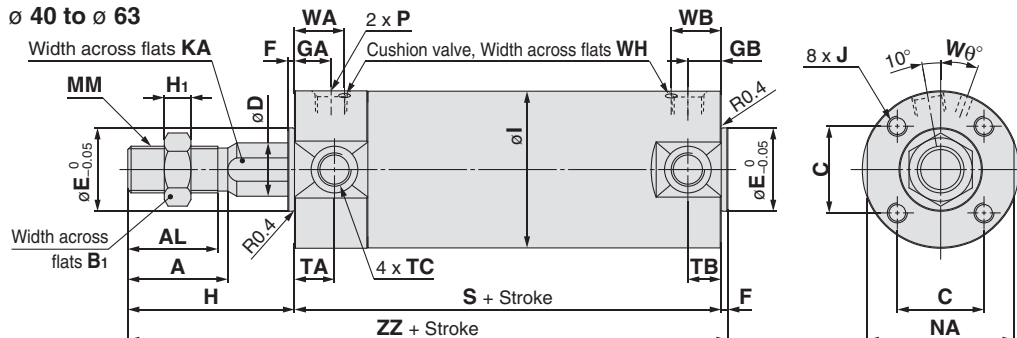
### With rubber bumper

ø 20 to ø 63



### With air cushion

ø 40 to ø 63

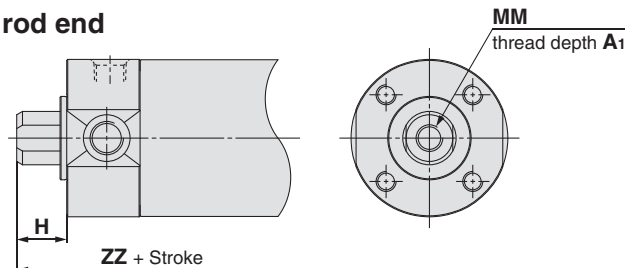


With Air Cushion [mm]

| Bore size | WA | WB      | Wθ  | WH  |
|-----------|----|---------|-----|-----|
| 40        | 17 | 15 (17) | 20° | 1.5 |
| 50        | 18 | 16 (18) | 20° | 3   |
| 63        | 18 | 17 (18) | 20° | 3   |

Note) ( ): Denotes the dimensions for long stroke.

### Female rod end



Female Rod End [mm]

| Bore size | A1 | H  | MM        | ZZ        |
|-----------|----|----|-----------|-----------|
| 20        | 8  | 13 | M4 x 0.7  | 84 (92)   |
| 25        | 8  | 14 | M5 x 0.8  | 85 (93)   |
| 32        | 12 | 14 | M6 x 1    | 87 (95)   |
| 40        | 13 | 15 | M8 x 1.25 | 95 (104)  |
| 50        | 18 | 16 | M10 x 1.5 | 108 (120) |
| 63        | 18 | 16 | M10 x 1.5 | 108 (120) |

| Bore size | Stroke range |             | A  | AL   | B1 | C    | D   | E  | F | GA | GB      | H  | H1 | I  | J                  | KA | MM         | NA   | P   | S        | TA | TB      | TC         | ZZ        |
|-----------|--------------|-------------|----|------|----|------|-----|----|---|----|---------|----|----|----|--------------------|----|------------|------|-----|----------|----|---------|------------|-----------|
|           | Standard     | Long stroke |    |      |    |      |     |    |   |    |         |    |    |    |                    |    |            |      |     |          |    |         |            |           |
| 20        | Up to 200    | 201 to 1500 | 18 | 15.5 | 13 | 14   | 9.2 | 12 | 2 | 12 | 10 (12) | 35 | 5  | 26 | M4 x 0.7 depth 7   | 8  | M8 x 1.25  | 24   | 1/8 | 69 (77)  | 11 | 11      | M5 x 0.8   | 106 (114) |
| 25        | Up to 300    | 301 to 1500 | 22 | 19.5 | 17 | 16.5 | 11  | 14 | 2 | 12 | 10 (12) | 40 | 6  | 31 | M5 x 0.8 depth 7.5 | 10 | M10 x 1.25 | 29   | 1/8 | 69 (77)  | 11 | 11      | M6 x 0.75  | 111 (119) |
| 32        | Up to 300    | 301 to 1500 | 22 | 19.5 | 17 | 20   | 12  | 18 | 2 | 12 | 10 (12) | 40 | 6  | 38 | M5 x 0.8 depth 8   | 10 | M10 x 1.25 | 35.5 | 1/8 | 71 (79)  | 11 | 10 (11) | M8 x 1.0   | 113 (121) |
| 40        | Up to 300    | 301 to 1500 | 30 | 27   | 19 | 26   | 16  | 25 | 2 | 13 | 10 (13) | 50 | 8  | 47 | M6 x 1 depth 12    | 14 | M14 x 1.5  | 44   | 1/8 | 78 (87)  | 12 | 10 (12) | M10 x 1.25 | 130 (139) |
| 50        | Up to 300    | 301 to 1500 | 35 | 32   | 27 | 32   | 20  | 30 | 2 | 14 | 12 (14) | 58 | 11 | 58 | M8 x 1.25 depth 16 | 18 | M18 x 1.5  | 55   | 1/4 | 90 (102) | 13 | 12 (13) | M12 x 1.25 | 150 (162) |
| 63        | Up to 300    | 301 to 1500 | 35 | 32   | 27 | 38   | 20  | 32 | 2 | 14 | 12 (14) | 58 | 11 | 72 | M10 x 1.5 depth 16 | 18 | M18 x 1.5  | 69   | 1/4 | 90 (102) | 13 | 12 (13) | M14 x 1.5  | 150 (162) |

Note 1) Dimensions for each mounting bracket are the same as those for the CG1 standard or long stroke model. Refer to pages 14 to 20.

Note 2) ( ): Denotes the dimensions for long stroke.

## ⚠ Precautions

**Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, <http://www.smc.eu>**

\* Caution on handling/disassembly is provided in addition to that shown below. Refer to page 10.

### Handling/Disassembly

#### ⚠ Caution

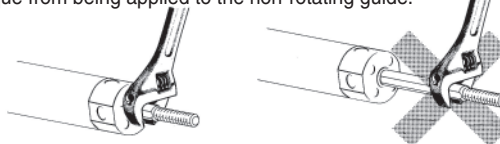
1. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.

- If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy. Refer to the table below for the approximate values of the allowable range of rotational torque.

| Allowable rotational torque (N·m or less) | ø 20 | ø 25, ø 32 | ø 40, ø 50, ø 63 |
|---|------|------------|------------------|
|   | 0.2  | 0.25       | 0.44             |

- To screw a bracket or a nut onto the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod

that protrudes. Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



2. When replacing rod seals, please contact SMC.

Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.