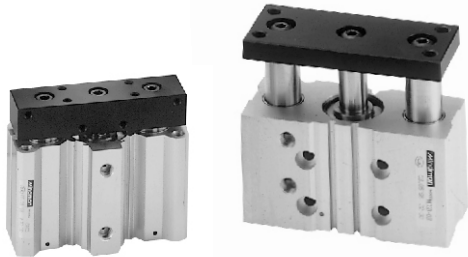


# MCG\* series Stop / Lift / Push

## TWIN-GUIDE CYLINDER

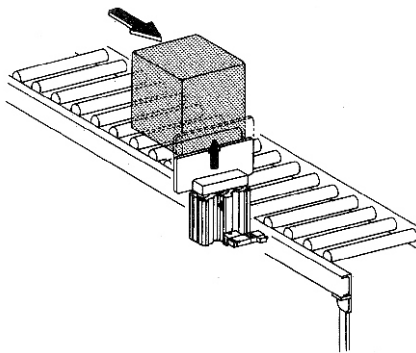


### Several uses

- Stopper cylinder
- Lift cylinder
- Pusher cylinder

### S-function

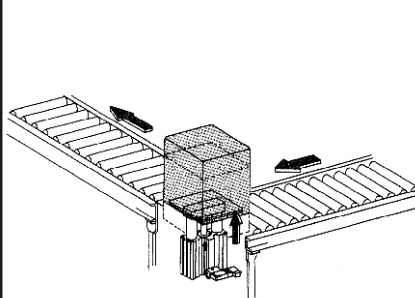
#### Stopper cylinder



Tough type of stopping a large-load work carrier at a fixed point, and for the straggle of a number of work carriers, etc.

### L-function

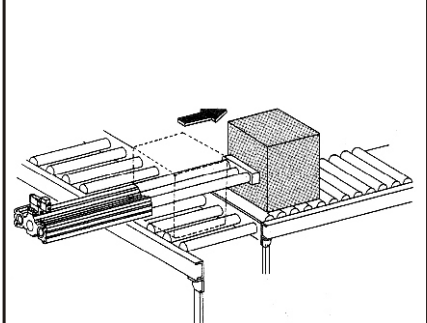
#### Lift cylinder



Special design which stands the large one-sided load. Lifts the work carrier at a fixed point not changing the posture.

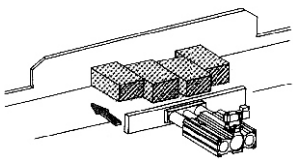
### P-function

#### Pusher cylinder



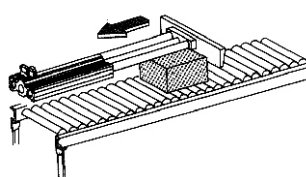
Long strokes available, the highly precise pushing work transfers and places a work carrier and changes the direction.

### Multi purpose



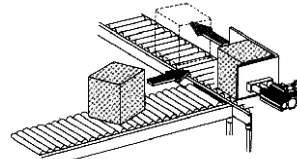
#### Arranges in line

Arranges the work carriers in line which have the same side face and which have been carried on the free flow line.



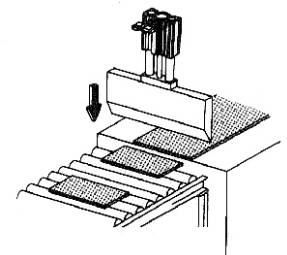
#### Draws in

Draws in the work carrier for the length of the stroke and slide it on the conveyor line.



#### Arranges the posture

Arranges the posture of a work carrier and push it out.



#### Cuts sheets

Can be used as a power source of sheets shearing machine.

# MCGB series

## TWIN-GUIDE CYLINDER



### Order example:

**MCGB - 03 - 12 - 50 - BSP**

MODEL

TUBE I.D.

STROKE

PURPOSE / TYPE OF BEARING

| Code | Purpose / Type of bearing  |
|------|----------------------------|
| 03   | Stop / Slide bearing       |
| 23*  | Push / Linear bush bearing |

PORT THREAD  
Blank: PT thread  
BSP: BSP thread  
NPT: NPT thread

\*Could attach a table for the use as a lifter

### Features:

- The long experience provided the following feature in pursuit of accuracy, durability and handiness.
- Connection from 2 direction and 3-type fixing (pierced hole bolt, back tapped hole, bottom tapped hole), and the miniature sensor switch recessed in the cylinder body.
- A special packing absorbs the shock sound at the end of the stroke.

### Specification:

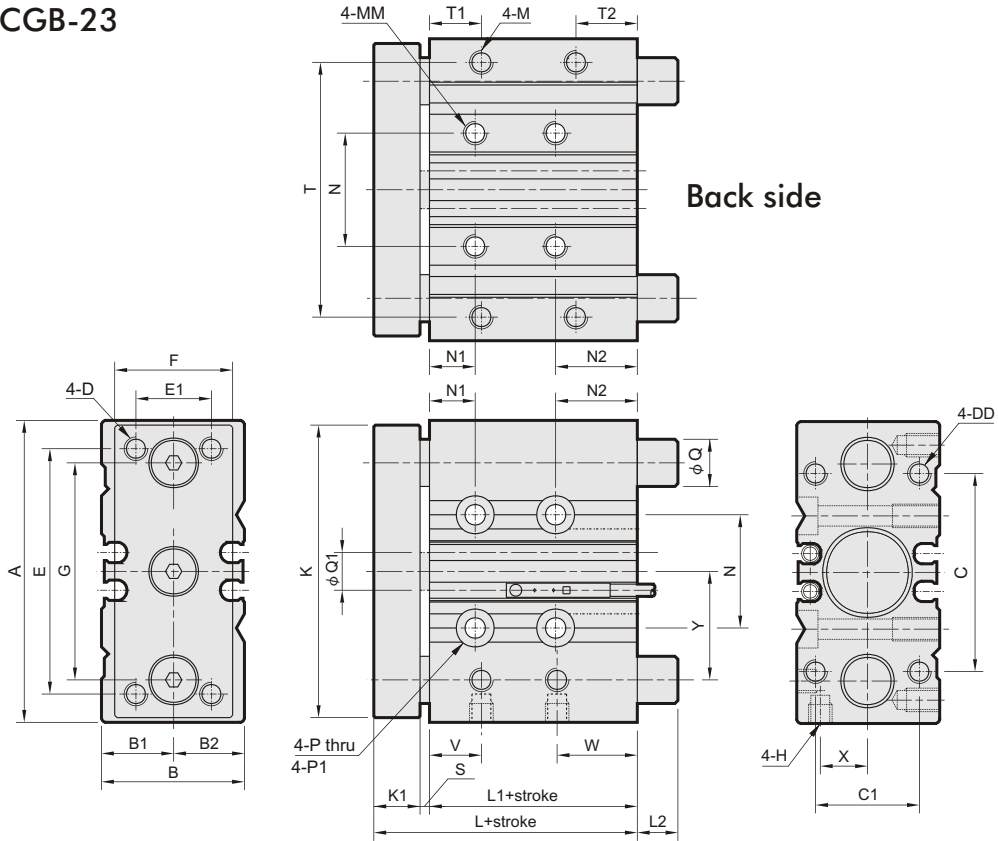
| Model                    | MCGB                      |                |        |
|--------------------------|---------------------------|----------------|--------|
| Model                    |                           |                |        |
| Acting type              | Double acting             |                |        |
| Tube I.D.(mm)            | 12, 16                    | 20, 25, 32, 40 | 50, 63 |
| Port size Rc(PT)         | M5×0.8                    | PT 1/8         | PT 1/4 |
| Medium                   | Air                       |                |        |
| Operating pressure range | 1~9.9 kgf/cm <sup>2</sup> |                |        |
| Proof pressure           | 15 kgf/cm <sup>2</sup>    |                |        |
| Ambient temperature      | -5~+60°C (No freezing)    |                |        |
| Cushion                  | With rubber cushion pad   |                |        |
| Lubrication              | Not required              |                |        |
| Sensor switch            | RCE, RCE1                 |                |        |

### Table for standard stroke

| Series variety | Bearing type        | Tube I.D. | Stroke (mm) |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|----------------|---------------------|-----------|-------------|----|----|----|----|----|----|-----|-----|-----|-----|-----|--|--|--|
|                |                     |           | 10          | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |  |  |  |
| MCGB-03        | Slide bearing       | φ 12      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 16      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 20      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 25      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 32*     |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 40      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 50      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
| MCGB-23        | Linear bush bearing | φ 12      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 16      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 20      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 25      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 32      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 40      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |
|                |                     | φ 50      |             |    |    |    |    |    |    |     |     |     |     |     |  |  |  |

\*1. MCGB-03 ~Tube I.D. φ 32: 25mm for the shortest standard stroke.  
2. Please consult us if stroke out of specification.

### MCGB-03/MCGB-23



### MCGB-03/MCGB-23

| Code<br>Tube I.D. | A   | B  | B1 | B2 | C  | C1 | D       | DD           | E  | E1 | F  | G    | H      | K   | K1 | L    | L1   | L2 | M            | MM           | N  | N1 | N2   | P     |
|-------------------|-----|----|----|----|----|----|---------|--------------|----|----|----|------|--------|-----|----|------|------|----|--------------|--------------|----|----|------|-------|
| 12                | 58  | 26 | 13 | 13 | 40 | 18 | M4×0.7  | M4×0.7×9dp   | 48 | 14 | 22 | 41.5 | M5×0.8 | 56  | 8  | 39   | 29   |    | M4×0.7×7dp   | M5×0.8×10dp  | 23 | 5  | 20   | φ 4.3 |
| 16                | 64  | 30 | 15 | 15 | 42 | 22 | M5×0.8  | M5×0.8×11dp  | 52 | 16 | 25 | 46   | M5×0.8 | 62  | 10 | 43   | 31   |    | M5×0.8×8dp   | M5×0.8×10dp  | 24 | 5  | 22   | φ 4.3 |
| 20                | 85  | 36 | 17 | 19 | 52 | 26 | M5×0.8  | M5×0.8×13dp  | 60 | 18 | 30 | 55   | PT 1/8 | 72  | 10 | 47   | 35   | *  | M5×0.8×7dp   | M6×1.0×12dp  | 28 | 19 | 16   | φ 5.3 |
| 25                | 96  | 42 | 21 | 21 | 62 | 32 | M6×1.0  | M6×1.0×15dp  | 70 | 26 | 38 | 65   | PT 1/8 | 86  | 10 | 47.5 | 35.5 |    | M6×1.0×9dp   | M6×1.0×12dp  | 34 | 22 | 12.5 | φ 5.3 |
| 32                | 116 | 51 | 26 | 25 | 80 | 38 | M8×1.25 | M8×1.25×18dp | 96 | 30 | 48 | 80   | PT 1/8 | 112 | 12 | 47.5 | 33.5 |    | M8×1.25×11dp | M8×1.25×16dp | 42 | 22 | 14.5 | φ 6.6 |

| Code<br>Tube I.D. | P1          | Q       |         | Q1 | S | T   | T1 | T2   | V    | W    | X    | Y    |
|-------------------|-------------|---------|---------|----|---|-----|----|------|------|------|------|------|
|                   |             | MCGB-03 | MCGB-23 |    |   |     |    |      |      |      |      |      |
| 12                | φ 8×4.5dp   | 8       | 6       | 6  | 2 | 50  | 12 | 12   | 11   | 15   | 8.5  | 19.5 |
| 16                | φ 8×4.5dp   | 10      | 8       | 8  | 2 | 54  | 11 | 13   | 11   | 17   | 10   | 23   |
| 20                | φ 9.5×5.5dp | 12      | 10      | 10 | 2 | 64  | 11 | 14   | 12   | 23   | 11.5 | 24.5 |
| 25                | φ 9.5×5.5dp | 16      | 13      | 12 | 2 | 76  | 12 | 13.5 | 11   | 23.5 | 13.5 | 24   |
| 32                | φ 11×6.5dp  | 20      | 16      | 16 | 2 | 100 | 12 | 16.5 | 11.5 | 25   | 16   | 31   |

### L2 dimensions list

#### MCGB-03

| Tube I.D. | Stroke (mm) |    |    |    |    |    |    |     |     |     |     |     |
|-----------|-------------|----|----|----|----|----|----|-----|-----|-----|-----|-----|
|           | 10          | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| 12        | 0           | 0  | 0  | 0  | 0  | 0  | 18 | 18  | 0   | 0   | 0   | 0   |
| 16        | 0           | 0  | 0  | 0  | 0  | 0  | 21 | 21  | 0   | 0   | 0   | 0   |
| 20        | 0           | 0  | 0  | 0  | 0  | 0  | 14 | 14  | 31  | 31  | 31  | 31  |
| 25        | 0           | 0  | 0  | 0  | 0  | 0  | 14 | 14  | 31  | 31  | 31  | 31  |
| 32        | 0           | 0  | 20 | 20 | 20 | 20 | 20 | 20  | 42  | 42  | 42  | 42  |

#### MCGB-23

| Tube I.D. | Stroke (mm) |    |    |    |    |    |    |     |     |     |     |     |
|-----------|-------------|----|----|----|----|----|----|-----|-----|-----|-----|-----|
|           | 10          | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| 12        | 0           | 0  | 0  | 0  | 14 | 14 | 14 | 14  | 0   | 0   | 0   | 0   |
| 16        | 0           | 0  | 0  | 0  | 21 | 21 | 21 | 21  | 0   | 0   | 0   | 0   |
| 20        | 0           | 0  | 0  | 0  | 27 | 27 | 27 | 27  | 50  | 50  | 50  | 50  |
| 25        | 0           | 2  | 2  | 2  | 32 | 32 | 32 | 32  | 50  | 50  | 50  | 50  |
| 32        | 0           | 0  | 8  | 8  | 8  | 8  | 42 | 42  | 55  | 55  | 55  | 55  |

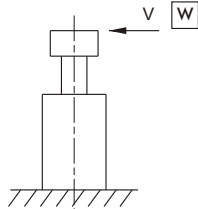
# MCGB-03/23 Stop / Lift $\phi 12 \sim \phi 32$

## TWIN-GUIDE CYLINDER



### Capacity graph

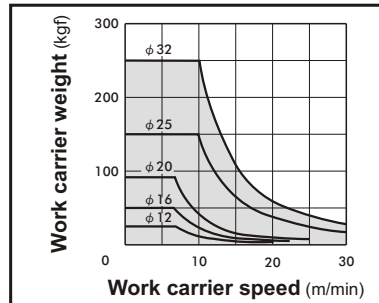
Capacity for the use as a stopper~



Linear bush bearing type is not available as a stopper.

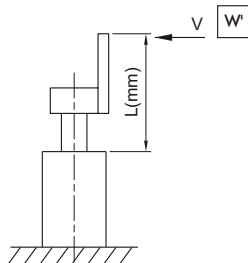
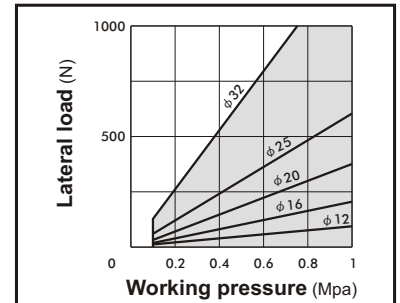
### stop capacity

MCGB-03...30st



### Normal lateral load

MCGB-03...30st



For the use of attaching a plate to the link bar, choose a bore size referring to the formula below.

### Coefficients for conversion

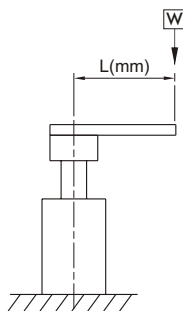
$$W = W' \times \frac{L}{\ell}$$

| MCGB series | $\phi 12$ | $\phi 16$ | $\phi 20$ | $\phi 25$ | $\phi 32$ |
|-------------|-----------|-----------|-----------|-----------|-----------|
| $\ell$      | 40        | 42        | 42        | 42        | 44        |

W: The maximum weight of the work carrier in the above graph for the stopper's capacity.

### Capacity for the use as a lifter~

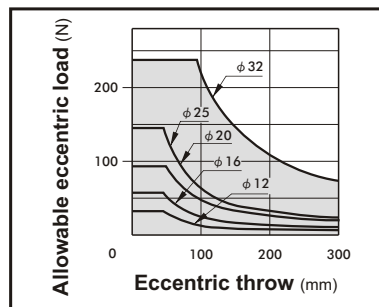
Allowable eccentricity load for the use as a lifter (at supply pressure 0.5MPa)



Show the dynamic allowable value at L(mm) eccentricity from the center of the guide rod.

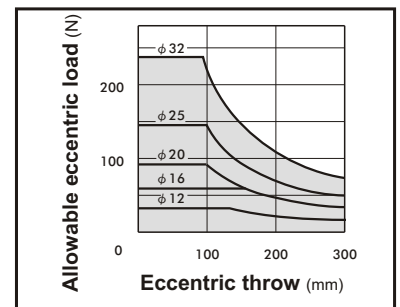
### Slide bearing

MCGB-03...10-50st



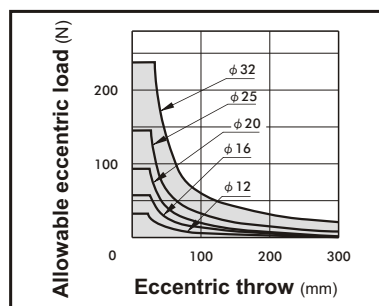
### Slide bearing

MCGB-03...75-200st



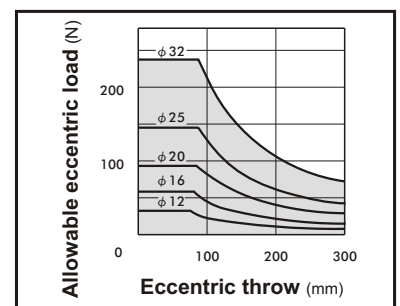
### Linear bush bearing

MCGB-23...10-50st



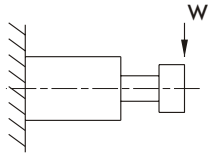
### Linear bush bearing

MCGB-23...75-200st



### Capacity table

#### Allowable lateral load :

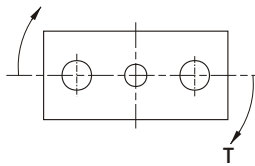


Shows the dynamic allowable value, when actuating the cylinder with lateral load  $W$  at the guide rods' top (vertical load against the guide rods).

(N)

| Tube I.D. | Bearing type        | Stroke (mm) |    |     |    |     |     |     |     |     |     |     |     |     |
|-----------|---------------------|-------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|           |                     | 10          | 20 | 25  | 30 | 40  | 50  | 75  | 100 | 125 | 150 | 175 | 200 |     |
| $\phi 12$ | Slide bearing       | 31          | 24 | /   | 19 | 16  | 13  | 37  | 31  | /   | /   | /   | /   |     |
|           | Linear bush bearing | 23          | 17 | /   | 14 | 34  | 30  | 23  | 19  | /   | /   | /   | /   |     |
| $\phi 16$ | Slide bearing       | 50          | 39 | /   | 32 | 27  | 24  | 54  | 45  | /   | /   | /   | /   |     |
|           | Linear bush bearing | 36          | 29 | /   | 24 | 59  | 52  | 40  | 33  | /   | /   | /   | /   |     |
| $\phi 20$ | Slide bearing       | /           | 51 | /   | 44 | 39  | 35  | 54  | 46  | 74  | 66  | 59  | 54  |     |
|           | Linear bush bearing | /           | 43 | /   | 36 | 98  | 87  | 69  | 57  | 46  | 40  | 36  | 32  |     |
| $\phi 25$ | Slide bearing       | /           | 68 | /   | 59 | 52  | 46  | 72  | 61  | 98  | 88  | 79  | 72  |     |
|           | Linear bush bearing | /           | 67 | /   | 56 | 148 | 132 | 105 | 87  | 70  | 62  | 55  | 50  |     |
| $\phi 32$ | Slide bearing       | /           | /  | 165 | /  | /   | /   | 129 | 106 | 90  | 138 | 123 | 111 | 101 |
|           | Linear bush bearing | /           | /  | 104 | /  | /   | /   | 74  | 165 | 138 | 114 | 100 | 90  | 81  |

#### Allowable rotating torque :

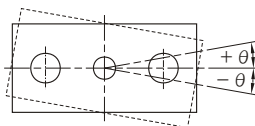


Shows the dynamic allowable value, when actuating the cylinder with a rotating torque  $T$  at the guide rods' top.

(N.m)

| Tube I.D. | Bearing type        | Stroke (mm) |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------|---------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|
|           |                     | 10          | 20   | 25   | 30   | 40   | 50   | 75   | 100  | 125  | 150  | 175  | 200  |      |
| $\phi 12$ | Slide bearing       | 0.64        | 0.48 | /    | 0.39 | 0.32 | 0.28 | 0.75 | 0.63 | /    | /    | /    | /    |      |
|           | Linear bush bearing | 0.47        | 0.35 | /    | 0.29 | 0.71 | 0.62 | 0.4  | 0.38 | /    | /    | /    | /    |      |
| $\phi 16$ | Slide bearing       | 1.14        | 0.9  | /    | 0.74 | 0.63 | 0.55 | 1.23 | 1.04 | /    | /    | /    | /    |      |
|           | Linear bush bearing | 0.84        | 0.66 | /    | 0.54 | 1.35 | 1.19 | 0.93 | 1.76 | /    | /    | /    | /    |      |
| $\phi 20$ | Slide bearing       | /           | 1.14 | /    | 1.21 | 1.07 | 0.95 | 1.49 | 1.25 | 2.03 | 1.81 | 1.63 | 1.48 |      |
|           | Linear bush bearing | /           | 1.19 | /    | 0.99 | 2.69 | 2.4  | 1.89 | 1.56 | 1.26 | 1.1  | 0.98 | 0.88 |      |
| $\phi 25$ | Slide bearing       | /           | 2.19 | /    | 1.88 | 1.65 | 1.47 | 2.31 | 1.94 | 3.15 | 2.8  | 2.52 | 2.3  |      |
|           | Linear bush bearing | /           | 2.14 | /    | 1.79 | 4.74 | 4.22 | 3.36 | 2.78 | 2.25 | 1.98 | 1.76 | 1.59 |      |
| $\phi 32$ | Slide bearing       | /           | /    | 6.61 | /    | /    | /    | 5.16 | 4.23 | 3.59 | 5.52 | 4.93 | 4.45 | 4.06 |
|           | Linear bush bearing | /           | /    | 4.17 | /    | /    | /    | 2.95 | 6.6  | 5.52 | 4.56 | 4.02 | 3.59 | 3.24 |

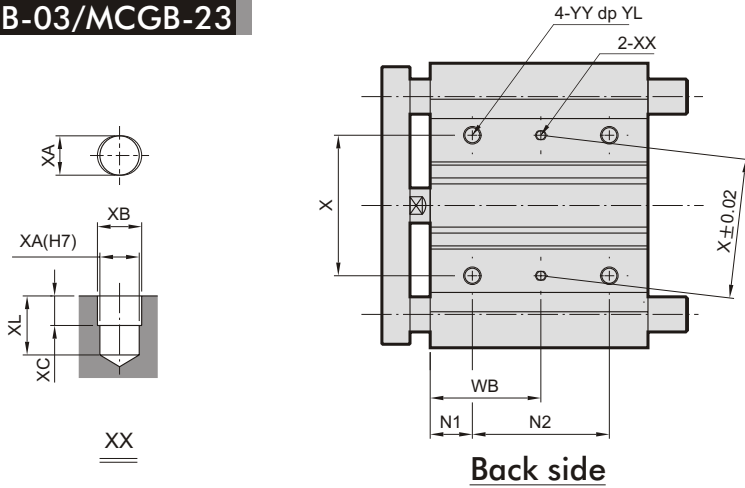
#### Anti-roll accuracy :



- The values are the deflection angle against the piston rod.
- Exclusive factor of the guide rods' deflection.

| Tube I.D. | Bearing type        | Anti-roll accuracy |
|-----------|---------------------|--------------------|
|           |                     | $\theta$           |
| $\phi 12$ | Slide bearing       | $\pm 0.09^\circ$   |
|           | Linear bush bearing | $\pm 0.06^\circ$   |
| $\phi 16$ | Slide bearing       | $\pm 0.08^\circ$   |
|           | Linear bush bearing | $\pm 0.06^\circ$   |
| $\phi 20$ | Slide bearing       | $\pm 0.08^\circ$   |
|           | Linear bush bearing | $\pm 0.03^\circ$   |
| $\phi 25$ | Slide bearing       | $\pm 0.07^\circ$   |
|           | Linear bush bearing | $\pm 0.05^\circ$   |
| $\phi 32$ | Slide bearing       | $\pm 0.07^\circ$   |
|           | Linear bush bearing | $\pm 0.03^\circ$   |

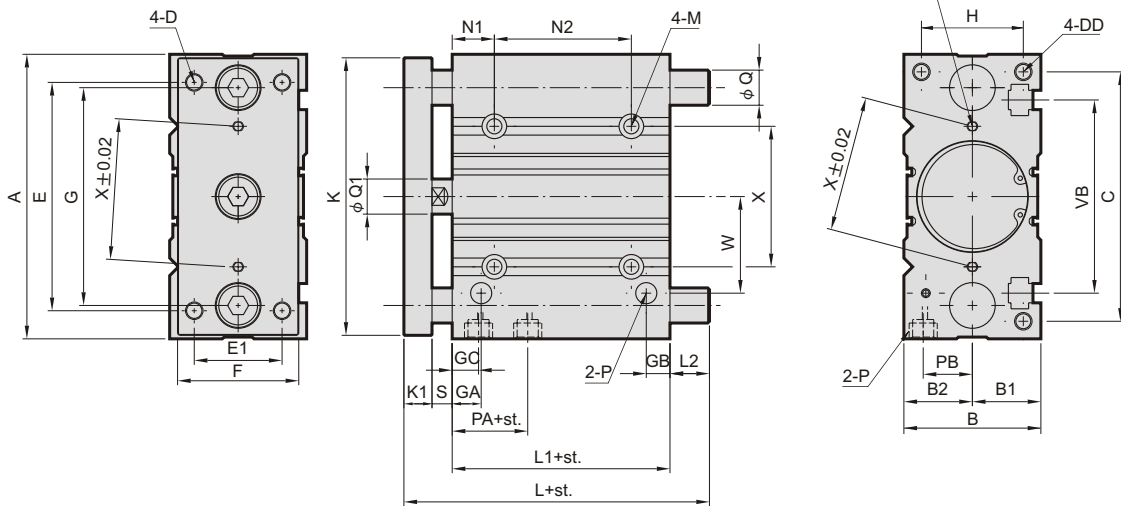
### MCGB-03/MCGB-23



T slot for hexagon head bolt

T slot for hexagon head bolt

| Tube I.D. | a   | b    | c   | d   | e    |
|-----------|-----|------|-----|-----|------|
| 40        | 6.5 | 10.5 | 5.5 | 4   | 11   |
| 50        | 8.5 | 13.5 | 7.5 | 4.5 | 13.5 |
| 63        | 11  | 17.8 | 10  | 7   | 18.5 |



### MCGB-03/MCGB-23

| Code<br>Tube I.D. | A   | B  | B1 | B2 | C   | D       | DD            | E   | E1 | F  | G   | GA   | GB   | GC   | H  | K   | K1 | L1 | M                     | N1 |
|-------------------|-----|----|----|----|-----|---------|---------------|-----|----|----|-----|------|------|------|----|-----|----|----|-----------------------|----|
| 40                | 120 | 54 | 27 | 27 | 106 | M8×1.25 | M8×1.25×20 dp | 104 | 30 | 44 | 86  | 14   | 10   | 14   | 40 | 118 | 12 | 44 | φ 6.6thru, φ 11×7.5dp | 22 |
| 50                | 148 | 64 | 32 | 32 | 130 | M10×1.5 | M10×1.5×22 dp | 130 | 40 | 60 | 110 | 14   | 11   | 12   | 46 | 146 | 16 | 44 | φ 8.6thru, φ 14×9dp   | 24 |
| 63                | 162 | 78 | 39 | 39 | 142 | M10×1.5 | M10×1.5×22 dp | 130 | 50 | 70 | 124 | 16.5 | 13.5 | 16.5 | 58 | 158 | 16 | 49 | φ 8.6thru, φ 14×9 dp  | 24 |

| Code<br>Tube I.D. | P      | PA | PB   | Q1 | S  | VB  | W  | X  | XA <sup>H7</sup> | XB  | XC | XL | YY      | YL | N2   |             |        | WB   |             |        |
|-------------------|--------|----|------|----|----|-----|----|----|------------------|-----|----|----|---------|----|------|-------------|--------|------|-------------|--------|
|                   |        |    |      |    |    |     |    |    |                  |     |    |    |         |    | 25st | 50,75,100st | 100st- | 25st | 50,75,100st | 100st- |
| 40                | PT 1/8 | 13 | 18   | 16 | 10 | 72  | 38 | 50 | 4                | 4.5 | 3  | 6  | M8×1.25 | 16 | 24   | 48          | 124    | 34   | 46          | 84     |
| 50                | PT 1/4 | 9  | 21.5 | 20 | 12 | 92  | 47 | 66 | 5                | 6   | 4  | 8  | M10×1.5 | 20 | 24   | 48          | 124    | 36   | 48          | 86     |
| 63                | PT 1/4 | 14 | 28   | 20 | 12 | 110 | 55 | 80 | 5                | 6   | 4  | 8  | M10×1.5 | 20 | 28   | 52          | 128    | 38   | 50          | 88     |

### MCGB-03

| Code<br>Tube I.D. | L       |       | L2      |       | Q    |
|-------------------|---------|-------|---------|-------|------|
|                   | 25,50ST | 50ST- | 25,50ST | 50ST- |      |
| 40                | 97      | 102   | 31      | 36    | φ 20 |
| 50                | 106.5   | 118   | 34.5    | 46    | φ 25 |
| 63                | 106.5   | 118   | 29.5    | 41    | φ 25 |

### MCGB-23

| Code<br>Tube I.D. | L       |          |        | L2      |          |        | Q    |
|-------------------|---------|----------|--------|---------|----------|--------|------|
|                   | 25,50ST | 75,100ST | 100ST- | 25,50ST | 75,100ST | 100ST- |      |
| 40                | 81      | 98       | 118    | 15      | 32       | 52     | φ 16 |
| 50                | 93      | 114      | 134    | 21      | 42       | 62     | φ 20 |
| 63                | 93      | 114      | 134    | 16      | 37       | 57     | φ 20 |

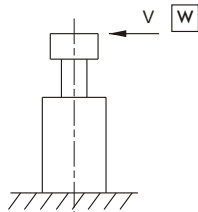
# MCGB-03/23 Stop / Lift $\phi 40 \sim \phi 63$

## TWIN-GUIDE CYLINDER



### Capacity graph

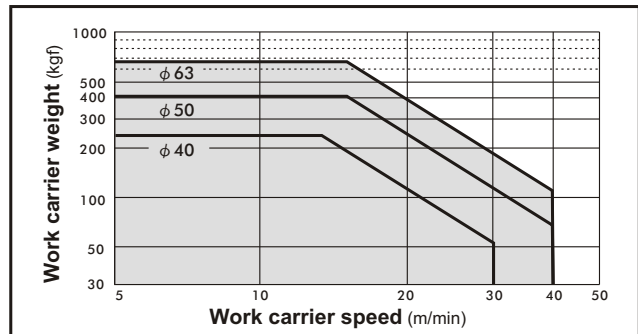
Capacity for the use as a stopper~



Linear bush bearing type is not available as a stopper.

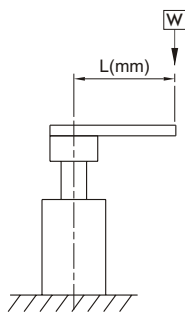
### stop capacity

MCGB-03...25st



### Capacity for the use as a lifter~

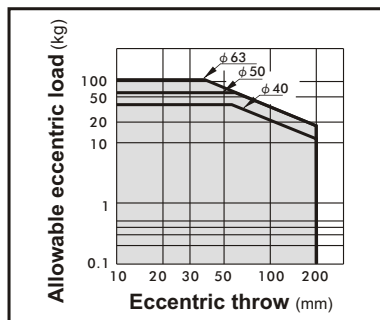
Allowable eccentricity load for the use as a lifter (at supply pressure 0.5MPa)



Show the dynamic allowable value at L(mm) eccentricity from the center of the guide rod.

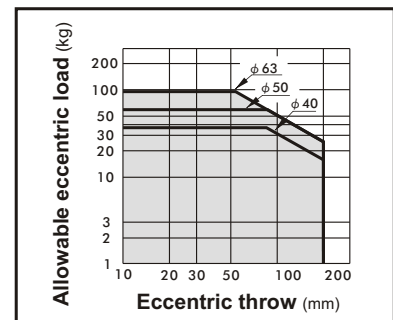
### Slide bearing

MCGB-03...25-50st



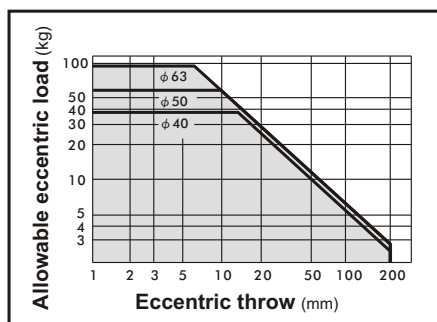
### Slide bearing

MCGB-03...75-100st



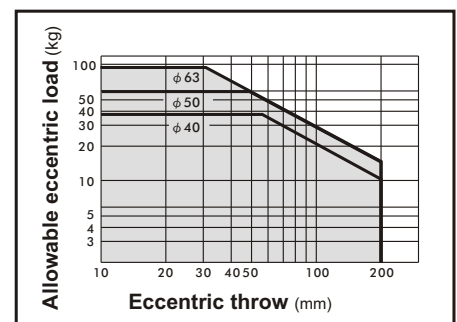
### Linear bush bearing

MCGB-23...25-50st



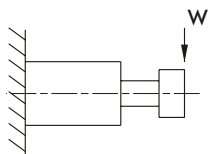
### Linear bush bearing

MCGB-23...75-100st



### Capacity table

#### Allowable lateral load :

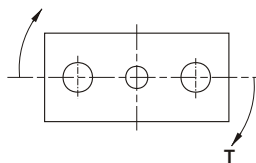


Shows the dynamic allowable value, when actuating the cylinder with lateral load W at the guide rods' top (vertical load against the guide rods).

| Tube I.D. | Bearing type        | Stroke (mm) |    |     |    |    |     |     |     |     |     |     |     |
|-----------|---------------------|-------------|----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|
|           |                     | 10          | 20 | 25  | 30 | 40 | 50  | 75  | 100 | 125 | 150 | 175 | 200 |
| $\phi 40$ | Slide bearing       | /           | /  | 203 | /  | /  | 164 | 182 | 159 | /   | /   | /   | /   |
|           | Linear bush bearing | /           | /  | 113 | /  | /  | 78  | 129 | 106 | /   | /   | /   | /   |
| $\phi 50$ | Slide bearing       | /           | /  | 296 | /  | /  | 245 | 273 | 241 | /   | /   | /   | /   |
|           | Linear bush bearing | /           | /  | 120 | /  | /  | 83  | 178 | 148 | /   | /   | /   | /   |
| $\phi 63$ | Slide bearing       | /           | /  | 296 | /  | /  | 245 | 273 | 241 | /   | /   | /   | /   |
|           | Linear bush bearing | /           | /  | 117 | /  | /  | 81  | 176 | 145 | /   | /   | /   | /   |

(N)

#### Allowable rotating torque :

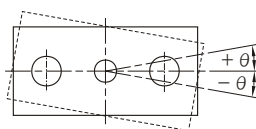


Shows the dynamic allowable value, when actuating the cylinder with a rotating torque T at the guide rods' top.

| Tube I.D. | Bearing type        | Stroke (mm) |    |      |    |    |      |      |      |     |     |     |     |
|-----------|---------------------|-------------|----|------|----|----|------|------|------|-----|-----|-----|-----|
|           |                     | 10          | 20 | 25   | 30 | 40 | 50   | 75   | 100  | 125 | 150 | 175 | 200 |
| $\phi 40$ | Slide bearing       | /           | /  | 7.00 | /  | /  | 5.66 | 6.27 | 5.48 | /   | /   | /   | /   |
|           | Linear bush bearing | /           | /  | 5.24 | /  | /  | 4.25 | 7.19 | 6.33 | /   | /   | /   | /   |
| $\phi 50$ | Slide bearing       | /           | /  | 13.0 | /  | /  | 10.8 | 12.0 | 10.6 | /   | /   | /   | /   |
|           | Linear bush bearing | /           | /  | 7.02 | /  | /  | 5.76 | 12.3 | 10.9 | /   | /   | /   | /   |
| $\phi 63$ | Slide bearing       | /           | /  | 14.7 | /  | /  | 12.1 | 13.5 | 12.0 | /   | /   | /   | /   |
|           | Linear bush bearing | /           | /  | 7.77 | /  | /  | 6.35 | 13.7 | 12.2 | /   | /   | /   | /   |

(N.m)

#### Anti-roll accuracy :



| TUBE I.D. | Bearing type        | Anti-roll accuracy |
|-----------|---------------------|--------------------|
|           |                     | $\theta$           |
| $\phi 40$ | Slide bearing       | $\pm 0.06^\circ$   |
|           | Linear bush bearing | $\pm 0.08^\circ$   |
| $\phi 50$ | Slide bearing       | $\pm 0.05^\circ$   |
|           | Linear bush bearing | $\pm 0.06^\circ$   |
| $\phi 63$ | Slide bearing       | $\pm 0.05^\circ$   |
|           | Linear bush bearing | $\pm 0.06^\circ$   |

- The values are the deflection angle against the piston rod.
- Exclusive factor of the guide rods' deflection.