

# Compact Guide Cylinder

# MGP Series

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

## How to Order

**MGP M 25 - 30 Z - M9BW**

Compact Guide Cylinder

Bearing type

|   |                             |
|---|-----------------------------|
| M | Slide bearing               |
| L | Ball bushing                |
| A | High precision ball bushing |

Bore size

|    |       |     |        |
|----|-------|-----|--------|
| 12 | 12 mm | 40  | 40 mm  |
| 16 | 16 mm | 50  | 50 mm  |
| 20 | 20 mm | 63  | 63 mm  |
| 25 | 25 mm | 80  | 80 mm  |
| 32 | 32 mm | 100 | 100 mm |

Port thread type

|     |          |
|-----|----------|
| Nil | M5 x 0.8 |
|     | Rc       |
| TN  | NPT      |
| TF  | G        |

\*: For bore sizes ø12 and ø16, only M5 x 0.8 is available.

Made to Order  
For details, refer to page 537.

Number of auto switches

|     |        |
|-----|--------|
| Nil | 2 pcs. |
| S   | 1 pc.  |
| n   | n pcs. |

Auto switch

|     |                                       |
|-----|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|-----|---------------------------------------|

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

Cylinder stroke [mm]

Refer to Standard Strokes on page 537.

### Proposals for Improving Water and Dust-resistance

SMC offers a wide range of models suitable for various operating environments. This includes models that can be used in environments that the basic model cannot, such as those where coolant liquid, water droplets/splashing, dust, etc., are present. See below for details.

• Water resistant cylinder (➔ Refer to page 540.)

• Cylinder with stable lubrication function (Lube-retainer) (➔ Refer to page 541.)

• Dust resistant cylinder (➔ Web Catalog)

### Applicable Auto Switches/Refer to pages 1289 to 1383 for further information on auto switches.

| Applicable Auto Switches                                          |                                              |                  |                 |                         |              |        |                        |                |                      |       |       |            |                     |                 |            |   |
|-------------------------------------------------------------------|----------------------------------------------|------------------|-----------------|-------------------------|--------------|--------|------------------------|----------------|----------------------|-------|-------|------------|---------------------|-----------------|------------|---|
| Refer to pages 123 to 126 for other 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     | Perpendicular          | In-line        | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z)      |                     |                 |            |   |
| Solid state auto switch                                           | —                                            | Grommet          | Yes             | 3-wire (NPN)            | 5 V, 12 V    | —      | M9NV                   | M9N            | ●                    | ●     | ●     | ○          | ○                   | —               | IC circuit |   |
|                                                                   | Diagnostic indication (2-color indicator)    |                  |                 | 3-wire (PNP)            |              |        | M9PV                   | M9P            | ●                    | ●     | ●     | ○          |                     |                 |            |   |
|                                                                   |                                              |                  |                 | 2-wire                  |              |        | M9BV                   | M9B            | ●                    | ●     | ●     | ○          |                     |                 |            |   |
|                                                                   |                                              |                  |                 | 3-wire (NPN)            |              |        | M9NWV                  | M9NW           | ●                    | ●     | ●     | ○          |                     |                 |            |   |
|                                                                   | Water resistant (2-color indicator)          |                  |                 | 3-wire (PNP)            | M9PWV        | M9PW   | ●                      | ●              | ●                    | ○     | —     | IC circuit |                     |                 |            |   |
|                                                                   |                                              |                  |                 | 2-wire                  | M9BWW        | M9BW   | ●                      | ●              | ●                    | ○     |       |            |                     |                 |            |   |
|                                                                   |                                              |                  |                 | 3-wire (NPN)            | M9NAV*1      | M9NA*1 | ○                      | ○              | ○                    | ○     |       |            |                     |                 |            |   |
|                                                                   | Magnetic field resistant (2-color indicator) |                  |                 | 3-wire (PNP)            | M9PAV*1      | M9PA*1 | ○                      | ○              | ○                    | ○     | —     | IC circuit |                     |                 |            |   |
| 2-wire                                                            |                                              | M9BAV*1          | M9BA*1          | ○                       | ○            | ○      | ○                      |                |                      |       |       |            |                     |                 |            |   |
| 2-wire (Non-polar)                                                |                                              | —                | P3DWA*2         | ●                       | —            | ●      | ○                      |                |                      |       |       |            |                     |                 |            |   |
| Reed auto switch                                                  | —                                            | Grommet          | Yes             | 3-wire (NPN equivalent) | —            | 5 V    | —                      | A96V           | A96                  | ●     | —     | ●          | —                   | —               | IC circuit | — |
|                                                                   | No                                           |                  |                 | 2-wire                  | 24 V         | 12 V   | 100 V<br>100 V or less | A93V*3<br>A90V | A93<br>A90           | ●     | ●     | ●          | ●                   | —               | —          |   |

\*1: Water resistant type auto switches are recommended on the above models, but in such case SMC cannot guarantee water resistance.

A water resistant type cylinder is recommended for use in an environment which requires water resistance.

\*2: The D-P3DWA is mountable on bore size ø25 to ø100.

\*3: 1 m type lead wire is only applicable to the D-A93.

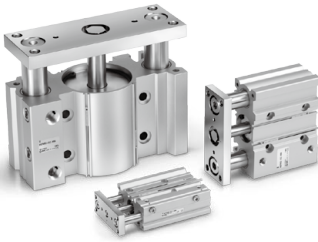
\*: Lead wire length symbols: 0.5 m.....Nil (Example) M9NW  
1 m.....M (Example) M9NWM  
3 m.....L (Example) M9NWL  
5 m.....Z (Example) M9NWW

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

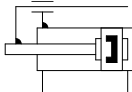
\*: Other than the auto switches listed above, the D-P4DW type can be mounted. Refer to page 595 for details.

\*: For details about auto switches with pre-wired connector, refer to pages 1358 and 1359.

\*: Auto switches are shipped together, (but not assembled).



**Symbol**  
Rubber bumper



**Made to Order: Individual Specifications**  
(For details, refer to pages 597 and 598.)

| Symbol | Specifications                            |
|--------|-------------------------------------------|
| -X144  | Symmetrical port position                 |
| -X471  | Enlarged plate and body gap dimensions    |
| -X867  | Side porting type (Plug location changed) |



**Made to Order**  
[Click here for details](#)

| Symbol   | Specifications                                                                                     |
|----------|----------------------------------------------------------------------------------------------------|
| -XA□     | Change of guide rod end shape                                                                      |
| -XB6     | Heat resistant cylinder (−10 to 150°C)                                                             |
| -XB10    | Intermediate stroke (Using exclusive body)                                                         |
| -XB13    | Low speed cylinder (5 to 50 mm/s)                                                                  |
| -XB22    | Shock absorber soft type <b>RJ series</b> type                                                     |
| -XC4     | With heavy duty scraper                                                                            |
| -XC6     | Made of stainless steel                                                                            |
| -XC8     | Adjustable stroke cylinder/Adjustable extension type                                               |
| -XC9     | Adjustable stroke cylinder/Adjustable retraction type                                              |
| -XC22    | Fluororubber seal                                                                                  |
| -XC35    | With coil scraper                                                                                  |
| -XC69    | With shock absorber                                                                                |
| -XC79    | Tapped hole, drilled hole, pinned hole machined additionally                                       |
| -XC82    | Bottom mounting type                                                                               |
| -XC85    | Grease for food processing equipment                                                               |
| -XC88(W) | Spatter resistant coil scraper, Lube-retainer, Grease for welding (Rod parts: Stainless steel 304) |
| -XC89W   | Spatter resistant coil scraper, Lube-retainer, Grease for welding (Rod parts: S45C)                |
| -XC91(W) | Spatter resistant coil scraper, Grease for welding (Rod parts: S45C)                               |
| -XC92    | Dust resistant actuator *1                                                                         |

\*1: The shape is the same as the current product.

|                                                                                          |
|------------------------------------------------------------------------------------------|
| Refer to pages 592 to 596 for cylinders with auto switches.                              |
| • Auto switch proper mounting position (detection at stroke end) and its mounting height |
| • Minimum stroke for auto switch mounting                                                |
| • Operating range                                                                        |
| • Auto switch mounting brackets/Part no.                                                 |
| • Auto Switch Mounting                                                                   |

## Specifications

| Bore size [mm]                | 12                                                   | 16 | 20      | 25 | 32 | 40 | 50 | 63 | 80             | 100 |
|-------------------------------|------------------------------------------------------|----|---------|----|----|----|----|----|----------------|-----|
| Action                        | Double acting                                        |    |         |    |    |    |    |    |                |     |
| Fluid                         | Air                                                  |    |         |    |    |    |    |    |                |     |
| Proof pressure                | 1.5 MPa                                              |    |         |    |    |    |    |    |                |     |
| Maximum operating pressure    | 1.0 MPa                                              |    |         |    |    |    |    |    |                |     |
| Minimum operating pressure    | 0.12 MPa                                             |    | 0.1 MPa |    |    |    |    |    |                |     |
| Ambient and fluid temperature | -10 to 60°C (No freezing)                            |    |         |    |    |    |    |    |                |     |
| Piston speed *1               | 50 to 500 mm/s                                       |    |         |    |    |    |    |    | 50 to 400 mm/s |     |
| Cushion                       | Rubber bumper on both ends                           |    |         |    |    |    |    |    |                |     |
| Lubrication                   | Not required (Non-lube)                              |    |         |    |    |    |    |    |                |     |
| Stroke length tolerance       | $\begin{smallmatrix} +1.5 \\ 0 \end{smallmatrix}$ mm |    |         |    |    |    |    |    |                |     |

\*1: Maximum speed with no load. Depending on the operating conditions, the piston speed may not be satisfied.

Make a model selection, considering a load according to the graph on pages 545 to 551.

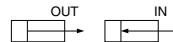
## Standard Strokes

| Bore size [mm] | Standard stroke [mm]                                            |
|----------------|-----------------------------------------------------------------|
| 12, 16         | 10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250            |
| 20, 25         | 20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400 |
| 32 to 100      | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400         |

## Manufacture of Intermediate Strokes

|                        |                                                                                                                                                                                                 |          |                                                                                                                                      |                                                                                      |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Description            | Spacer installation type<br>Spacers are installed in the standard stroke cylinder.<br>• ø12 to ø32: Available in 1 mm stroke increments.<br>• ø40 to ø100: Available in 5 mm stroke increments. |          | Exclusive body (-XB10)<br>Dealing with the stroke by making an exclusive body.<br>• All bore sizes are available in 1 mm increments. |                                                                                      |
| Model no.              | Refer to How to Order for the standard model numbers.                                                                                                                                           |          |                                                                                                                                      | Add "XB10" to the end of standard model number. For details, refer to Made to Order. |
| Applicable stroke [mm] | ø12, ø16                                                                                                                                                                                        | 1 to 249 | ø12, ø16                                                                                                                             | 11 to 249                                                                            |
|                        | ø20, ø25, ø32                                                                                                                                                                                   | 1 to 399 | ø20, ø25                                                                                                                             | 21 to 399                                                                            |
|                        | ø40 to ø100                                                                                                                                                                                     | 5 to 395 | ø32 to ø100                                                                                                                          | 26 to 399                                                                            |
| Example                | Part no.: MGPM20-39Z<br>A spacer 1 mm in width is installed in the MGPM20-40. C dimension is 77 mm.                                                                                             |          | Part no.: MGPM20-39Z-XB10<br>Special body manufactured for 39 stroke. C dimension is 76 mm.                                          |                                                                                      |

## Theoretical Output



[N]

| Bore size [mm] | Rod size [mm] | Operating direction | Piston area [mm <sup>2</sup> ] | Operating pressure [MPa] |      |      |      |      |      |      |      |      |  |
|----------------|---------------|---------------------|--------------------------------|--------------------------|------|------|------|------|------|------|------|------|--|
|                |               |                     |                                | 0.2                      | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |  |
| 12             | 6             | OUT                 | 113                            | 23                       | 34   | 45   | 57   | 68   | 79   | 90   | 102  | 113  |  |
|                |               | IN                  | 85                             | 17                       | 25   | 34   | 42   | 51   | 59   | 68   | 76   | 85   |  |
| 16             | 8             | OUT                 | 201                            | 40                       | 60   | 80   | 101  | 121  | 141  | 161  | 181  | 201  |  |
|                |               | IN                  | 151                            | 30                       | 45   | 60   | 75   | 90   | 106  | 121  | 136  | 151  |  |
| 20             | 10            | OUT                 | 314                            | 63                       | 94   | 126  | 157  | 188  | 220  | 251  | 283  | 314  |  |
|                |               | IN                  | 236                            | 47                       | 71   | 94   | 118  | 141  | 165  | 188  | 212  | 236  |  |
| 25             | 10            | OUT                 | 491                            | 98                       | 147  | 196  | 245  | 295  | 344  | 393  | 442  | 491  |  |
|                |               | IN                  | 412                            | 82                       | 124  | 165  | 206  | 247  | 289  | 330  | 371  | 412  |  |
| 32             | 14            | OUT                 | 804                            | 161                      | 241  | 322  | 402  | 483  | 563  | 643  | 724  | 804  |  |
|                |               | IN                  | 650                            | 130                      | 195  | 260  | 325  | 390  | 455  | 520  | 585  | 650  |  |
| 40             | 14            | OUT                 | 1257                           | 251                      | 377  | 503  | 628  | 754  | 880  | 1005 | 1131 | 1257 |  |
|                |               | IN                  | 1103                           | 221                      | 331  | 441  | 551  | 662  | 772  | 882  | 992  | 1103 |  |
| 50             | 18            | OUT                 | 1963                           | 393                      | 589  | 785  | 982  | 1178 | 1374 | 1571 | 1767 | 1963 |  |
|                |               | IN                  | 1709                           | 342                      | 513  | 684  | 855  | 1025 | 1196 | 1367 | 1538 | 1709 |  |
| 63             | 18            | OUT                 | 3117                           | 623                      | 935  | 1247 | 1559 | 1870 | 2182 | 2494 | 2806 | 3117 |  |
|                |               | IN                  | 2863                           | 573                      | 859  | 1145 | 1431 | 1718 | 2004 | 2290 | 2576 | 2863 |  |
| 80             | 22            | OUT                 | 5027                           | 1005                     | 1508 | 2011 | 2513 | 3016 | 3519 | 4021 | 4524 | 5027 |  |
|                |               | IN                  | 4646                           | 929                      | 1394 | 1859 | 2323 | 2788 | 3252 | 3717 | 4182 | 4646 |  |
| 100            | 26            | OUT                 | 7854                           | 1571                     | 2356 | 3142 | 3927 | 4712 | 5498 | 6283 | 7069 | 7854 |  |
|                |               | IN                  | 7323                           | 1465                     | 2197 | 2929 | 3662 | 4394 | 5126 | 5858 | 6591 | 7323 |  |

\*: Theoretical output [N] = Pressure [MPa] × Piston area [mm<sup>2</sup>]

## Weights

### Slide Bearing: MGPM12 to 100

| Bore size<br>[mm] | Standard stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | [kg] |
|-------------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                   | 10                   | 20   | 25   | 30   | 40   | 50   | 75   | 100  | 125  | 150  | 175  | 200  | 250  | 300  | 350  | 400  |      |
| 12                | 0.22                 | 0.25 | —    | 0.29 | 0.33 | 0.36 | 0.46 | 0.55 | 0.66 | 0.75 | 0.84 | 0.93 | 1.11 | —    | —    | —    |      |
| 16                | 0.32                 | 0.37 | —    | 0.42 | 0.46 | 0.51 | 0.66 | 0.78 | 0.94 | 1.06 | 1.18 | 1.31 | 1.55 | —    | —    | —    |      |
| 20                | —                    | 0.59 | —    | 0.67 | 0.74 | 0.82 | 1.06 | 1.24 | 1.43 | 1.61 | 1.80 | 1.99 | 2.42 | 2.79 | 3.16 | 3.53 |      |
| 25                | —                    | 0.84 | —    | 0.94 | 1.04 | 1.14 | 1.50 | 1.75 | 2.00 | 2.25 | 2.50 | 2.75 | 3.35 | 3.85 | 4.34 | 4.84 |      |
| 32                | —                    | —    | 1.41 | —    | —    | 1.77 | 2.22 | 2.57 | 2.93 | 3.29 | 3.65 | 4.00 | 4.90 | 5.61 | 6.33 | 7.04 |      |
| 40                | —                    | —    | 1.64 | —    | —    | 2.04 | 2.52 | 2.92 | 3.32 | 3.71 | 4.11 | 4.50 | 5.47 | 6.26 | 7.06 | 7.85 |      |
| 50                | —                    | —    | 2.79 | —    | —    | 3.38 | 4.13 | 4.71 | 5.30 | 5.89 | 6.47 | 7.06 | 8.55 | 9.73 | 10.9 | 12.1 |      |
| 63                | —                    | —    | 3.48 | —    | —    | 4.15 | 4.99 | 5.67 | 6.34 | 7.02 | 7.69 | 8.37 | 10.0 | 11.4 | 12.7 | 14.1 |      |
| 80                | —                    | —    | 5.41 | —    | —    | 6.26 | 7.41 | 8.26 | 9.10 | 9.95 | 10.8 | 11.6 | 13.9 | 15.6 | 17.3 | 19.0 |      |
| 100               | —                    | —    | 9.12 | —    | —    | 10.3 | 12.0 | 13.2 | 14.4 | 15.6 | 16.9 | 18.1 | 21.2 | 23.6 | 26.1 | 28.5 |      |

### Ball Bushing: MGPL12 to 100, High Precision Ball Bushing: MGPA12 to 100

| Bore size<br>[mm] | Standard stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | [kg] |
|-------------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                   | 10                   | 20   | 25   | 30   | 40   | 50   | 75   | 100  | 125  | 150  | 175  | 200  | 250  | 300  | 350  | 400  |      |
| 12                | 0.21                 | 0.24 | —    | 0.27 | 0.32 | 0.35 | 0.43 | 0.50 | 0.59 | 0.67 | 0.75 | 0.83 | 0.99 | —    | —    | —    |      |
| 16                | 0.31                 | 0.35 | —    | 0.40 | 0.47 | 0.51 | 0.62 | 0.72 | 0.85 | 0.96 | 1.06 | 1.17 | 1.38 | —    | —    | —    |      |
| 20                | —                    | 0.60 | —    | 0.66 | 0.79 | 0.85 | 1.01 | 1.17 | 1.36 | 1.52 | 1.68 | 1.84 | 2.17 | 2.49 | 2.81 | 3.13 |      |
| 25                | —                    | 0.87 | —    | 0.96 | 1.12 | 1.20 | 1.41 | 1.62 | 1.86 | 2.06 | 2.27 | 2.48 | 2.92 | 3.33 | 3.75 | 4.16 |      |
| 32                | —                    | —    | 1.37 | —    | —    | 1.66 | 2.08 | 2.37 | 2.74 | 3.03 | 3.31 | 3.60 | 4.25 | 4.82 | 5.39 | 5.97 |      |
| 40                | —                    | —    | 1.59 | —    | —    | 1.92 | 2.38 | 2.70 | 3.11 | 3.44 | 3.77 | 4.09 | 4.81 | 5.46 | 6.11 | 6.76 |      |
| 50                | —                    | —    | 2.65 | —    | —    | 3.14 | 3.85 | 4.34 | 4.97 | 5.47 | 5.96 | 6.45 | 7.57 | 8.56 | 9.54 | 10.5 |      |
| 63                | —                    | —    | 3.33 | —    | —    | 3.91 | 4.71 | 5.29 | 6.01 | 6.59 | 7.17 | 7.75 | 9.05 | 10.2 | 11.4 | 12.5 |      |
| 80                | —                    | —    | 5.27 | —    | —    | 6.29 | 7.49 | 8.21 | 8.92 | 9.64 | 10.4 | 11.1 | 12.9 | 14.3 | 15.7 | 17.2 |      |
| 100               | —                    | —    | 8.62 | —    | —    | 10.1 | 11.8 | 12.9 | 13.9 | 15.0 | 16.0 | 17.1 | 19.6 | 21.7 | 23.8 | 25.9 |      |



## ① Clean Series

Applicable in a clean room environment. Ideal for use in conveyor lines for semiconductor (LSI), liquid crystal (LCD), food processing, pharmaceutical, and electronic parts, etc.

### How to Order

| 12                          | MGPL             | Bore size     | Stroke   | Z |
|-----------------------------|------------------|---------------|----------|---|
| ● Clean room specifications |                  | ● Thread type |          |   |
| 12                          | Relief port type | NII           | M5 x 0.8 |   |
| 13                          | Vacuum port type |               | Rc       |   |
|                             |                  | TN            | NPT      |   |
|                             |                  | TF            | G        |   |

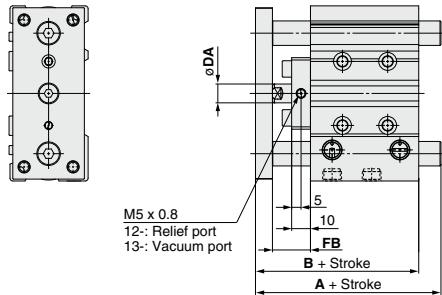
### Specifications

| Applicable series | MGPL                 |    |           |    |           |    |    |    |
|-------------------|----------------------|----|-----------|----|-----------|----|----|----|
| Bearing type      | Ball bushing bearing |    |           |    |           |    |    |    |
| Bore size [mm]    | 12                   | 16 | 20        | 25 | 32        | 40 | 50 | 63 |
| Stroke [mm]       | 10 to 250            |    | 20 to 400 |    | 25 to 400 |    |    |    |

\*: Specifications other than above are the same as standard, basic type.

\*: For bore sizes 12 and 16,  
M5 x 0.8 is only available.

### Dimensions



\*: For details, refer to the **Web Catalog**.

\*: Other dimensions are the same as standard products. \*: The dimensions in ( ) are the same as standard type. [mm]

| Bore size [mm] | A             |                             |                              |             | B    | DA   | FB |
|----------------|---------------|-----------------------------|------------------------------|-------------|------|------|----|
|                | 30 st or less | Over 30 st and up to 100 st | Over 100 st and up to 200 st | Over 200 st |      |      |    |
| 12             | 56            | 68                          | 97.5                         | 97.5        | 55   | (6)  | 19 |
| 16             | 62            | 78                          | 107.5                        | 107.5       | 59   | (8)  | 19 |
| 20             | 72            | 89                          | 113                          | 130.5       | 66   | (10) | 21 |
| 25             | 78.5          | 94.5                        | 113.5                        | 130.5       | 66.5 | (10) | 20 |

\*: For bore size ø12 and ø16, only M5 x 0.8 port is available.

\*: For bore size ø20 or more, choice of Rc, NPT, G port is available. (Refer to page 536.)

| Bore size [mm] | A             |                             |                              |             | B    | DA   | FB |
|----------------|---------------|-----------------------------|------------------------------|-------------|------|------|----|
|                | 50 st or less | Over 50 st and up to 100 st | Over 100 st and up to 200 st | Over 200 st |      |      |    |
| 32             | 91.5          | 108.5                       | 128.5                        | 150.5       | 71.5 | (14) | 24 |
| 40             | 91.5          | 108.5                       | 128.5                        | 150.5       | 78   | (14) | 24 |
| 50             | 102.5         | 123.5                       | 143.5                        | 170.5       | 83   | 20   | 27 |
| 63             | 102.5         | 123.5                       | 143.5                        | 170.5       | 88   | 20   | 27 |

\*: Choice of Rc, NPT, G port is available. (Refer to page 536.)

# MGP Series

## ②Water Resistant Cylinder

Ideal for use in a machine tool environment exposed to coolants. Applicable for use in an environment with water splashing such as food processing and car wash equipment, etc.



### How to Order

MGPM Bore size **R** – Stroke Z – M9 **A(V)L** – **XC6A**

Thread type

|     |     |
|-----|-----|
| NII | Rc  |
| TN  | NPT |
| TF  | G   |

Water Resistant Cylinder

|   |                            |
|---|----------------------------|
| R | NBR seals (Nitrile rubber) |
| V | FKM seals (Fluororubber)   |

Water resistant  
2-color indicator  
solid state auto  
switch

Made to Order

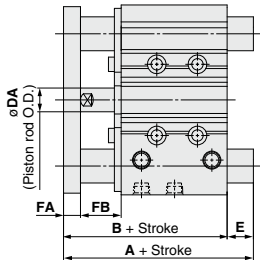
※: Piston rod and guide rod are made of stainless steel.  
※: Cannot be used in environments in which liquids or coolants that contain sulfur are used

### Specifications

| Applicable series          | MGPM                                             |
|----------------------------|--------------------------------------------------|
| Bearing type               | Slide bearing                                    |
| Bore size [mm]             | 20, 25, 32, 40, 50, 63, 80, 100                  |
| Cushion                    | MGPM□□R Rubber bumper<br>MGPM□□V Without cushion |
| Minimum operating pressure | 0.13 MPa                                         |
| Made to Order              | XC6A Specified parts made of stainless steel     |

※: Bore sizes 12 and 16 mm are only available as a special order.  
※: Specifications other than above are the same as standard, basic type.  
※: For details on the made-to-order XC6A with specified parts made of stainless steel, refer to page 1488.

### Dimensions



#### Water resistant

[mm]

| Bore size [mm] | A             |                             |             | B     | DA   | FA   | FB |
|----------------|---------------|-----------------------------|-------------|-------|------|------|----|
|                | 50 st or less | Over 50 st and up to 200 st | Over 200 st |       |      |      |    |
| 20             | 66            | 90.5                        | 123         | 66    | (10) | (8)  | 21 |
| 25             | 67.5          | 91.5                        | 123.5       | 67.5  | (10) | (9)  | 21 |
| 32             | 87            | 105.5                       | 141.5       | 71.5  | (14) | (10) | 24 |
| 40             | 87            | 105.5                       | 141.5       | 78    | (14) | (10) | 24 |
| 50             | 99.5          | 120.5                       | 161.5       | 83    | 20   | (12) | 27 |
| 63             | 99.5          | 120.5                       | 161.5       | 88    | 20   | (12) | 27 |
| 80             | 110.5         | 137.5                       | 186.5       | 102.5 | 25   | (16) | 30 |
| 100            | 130.5         | 155.5                       | 194.5       | 120   | 30   | (19) | 35 |

#### Water resistant + XC6A

[mm]

| Bore size [mm] | A             |                             |             | B     | DA   | FA | FB |
|----------------|---------------|-----------------------------|-------------|-------|------|----|----|
|                | 50 st or less | Over 50 st and up to 200 st | Over 200 st |       |      |    |    |
| 20             | 66            | 90.5                        | 123         | 66    | (10) | 9  | 20 |
| 25             | 67.5          | 91.5                        | 123.5       | 67.5  | (10) | 10 | 20 |
| 32             | 87            | 105.5                       | 141.5       | 71.5  | (14) | 12 | 22 |
| 40             | 87            | 105.5                       | 141.5       | 78    | (14) | 12 | 22 |
| 50             | 99.5          | 120.5                       | 161.5       | 83    | 20   | 16 | 23 |
| 63             | 99.5          | 120.5                       | 161.5       | 88    | 20   | 16 | 23 |
| 80             | 110.5         | 137.5                       | 186.5       | 102.5 | 25   | 19 | 27 |
| 100            | 130.5         | 155.5                       | 194.5       | 120   | 30   | 22 | 32 |

※: Other dimensions are the same as standard products.  
※: The dimensions in ( ) are the same as standard type.

Click [here](#) for details.

### ③ Cylinder with Stable Lubrication Function (Lube-retainer)

Improves durability in environments with micro-powder. (Compared with the standard model)  
In addition, the overall length and mounting are the same as those of the standard model.



#### How to Order

MGP **Bearing type** **Bore size** **Port thread type** **M** — **Stroke** **Z** — **Auto switch**

• Cylinder with stable lubrication function (Lube-retainer)

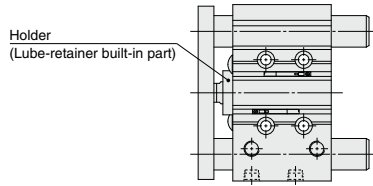
#### Specifications

|                            |                                 |
|----------------------------|---------------------------------|
| Bore size [mm]             | 20, 25, 32, 40, 50, 63, 80, 100 |
| Minimum operating pressure | 0.15 MPa                        |

\*: Bore sizes 12 and 16 mm are only available as a special order.

\*: Specifications other than above are the same as standard, basic type.

#### Dimensions (Dimensions are the same as the standard type.)



Click [here](#) for details.

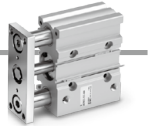
### ④ Guide Unit with Lube-retainer

#### How to Order

MGP **M** **Bore size** **Port thread type** **G** — **Stroke** **Z** — **Auto switch**

• Slide bearing

• Guide unit with Lube-retainer



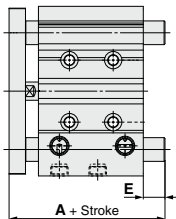
#### Specifications

|                |                                 |
|----------------|---------------------------------|
| Bore size [mm] | 20, 25, 32, 40, 50, 63, 80, 100 |
| Bearing type   | Slide bearing                   |

\*: Bore sizes 12 and 16 mm are only available as a special order.

\*: Specifications other than above are the same as standard, basic type.

#### Dimensions (Dimensions other than below are the same as standard type.)



| Bore size<br>[mm] | A             |                         |             | E             |                         |             |
|-------------------|---------------|-------------------------|-------------|---------------|-------------------------|-------------|
|                   | 50 st or less | Over 50 st<br>to 200 st | Over 200 st | 50 st or less | Over 50 st<br>to 200 st | Over 200 st |
|                   | (53)          | 83                      | 115.5       | (0)           | 30                      | 62.5        |
| 20                | (53)          | 83                      | 115.5       | (0)           | 30                      | 62.5        |
| 25                | (53.5)        | 83.5                    | 115.5       | (0)           | 30                      | 62          |
| 32                | 82            | 100.5                   | 136.5       | 22.5          | 41                      | 77          |
| 40                | 82            | 100.5                   | 136.5       | 16            | 34.5                    | 70.5        |
| 50                | 95.5          | 116.5                   | 157.5       | 23.5          | 44.5                    | 85.5        |
| 63                | 95.5          | 116.5                   | 157.5       | 18.5          | 39.5                    | 80.5        |
| 80                | 113.5         | 140.5                   | 189.5       | 17            | 44                      | 93          |
| 100               | 135.5         | 160.5                   | 199.5       | 19.5          | 44.5                    | 83.5        |

The dimensions in ( ) are the same as standard type.

⑤ With Flange

Plate side flange type is added.



How to Order

MGP Bearing type **F** Bore size Port thread type — Stroke **Z** — Auto switch

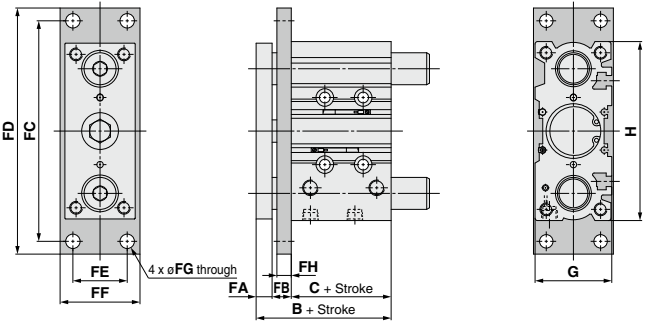
• With flange

**⚠ Caution**

**Specifications: Same as standard type**

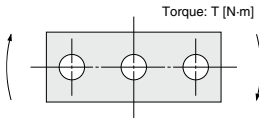
**This product cannot be used as a stopper.**

**Dimensions** (Dimensions other than below are the same as standard type.)



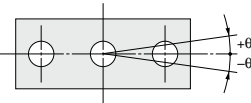
| (mm)      |      |      |    |    |     |     |    |     |      |    |       |     | Flange weight (kg) |
|-----------|------|------|----|----|-----|-----|----|-----|------|----|-------|-----|--------------------|
| Bore size | B    | C    | FA | FB | FC  | FD  | FE | FF  | FG   | FH | G     | H   |                    |
| 12        | 42   | 29   | 7  | 6  | 80  | 89  | 18 | 25  | 4.5  | 5  | 26    | 58  | 0.08               |
| 16        | 46   | 33   | 7  | 6  | 88  | 98  | 22 | 32  | 5.5  | 5  | 30    | 64  | 0.11               |
| 20        | 53   | 37   | 8  | 8  | 102 | 112 | 24 | 38  | 5.5  | 6  | 36    | 83  | 0.17               |
| 25        | 53.5 | 37.5 | 9  | 7  | 114 | 126 | 30 | 40  | 6.6  | 6  | 42    | 93  | 0.20               |
| 32        | 59.5 | 37.5 | 10 | 12 | 138 | 154 | 34 | 50  | 9    | 9  | 48    | 112 | 0.46               |
| 40        | 66   | 44   | 10 | 12 | 146 | 162 | 40 | 60  | 9    | 9  | 54    | 120 | 0.60               |
| 50        | 72   | 44   | 12 | 16 | 178 | 198 | 46 | 65  | 11   | 10 | 64    | 148 | 0.87               |
| 63        | 77   | 49   | 12 | 16 | 192 | 212 | 58 | 75  | 11   | 10 | 78    | 162 | 1.09               |
| 80        | 96.5 | 56.5 | 16 | 24 | 238 | 262 | 54 | 90  | 13.5 | 16 | 91.5  | 202 | 2.59               |
| 100       | 116  | 66   | 19 | 31 | 280 | 308 | 62 | 100 | 15.5 | 22 | 111.5 | 240 | 4.63               |

## Allowable Rotational Torque of Plate



| Bore size<br>[mm] | Bearing type | Stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | T [N·m] |  |
|-------------------|--------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---------|--|
|                   |              | 10          | 20   | 25   | 30   | 40   | 50   | 75   | 100  | 125  | 150  | 175  | 200  | 250  | 300  | 350  | 400  |         |  |
| 12                | MGPM         | 0.39        | 0.32 | —    | 0.27 | 0.24 | 0.21 | 0.43 | 0.36 | 0.31 | 0.27 | 0.24 | 0.22 | 0.19 | —    | —    | —    |         |  |
|                   | MGPL/A       | 0.61        | 0.45 | —    | 0.35 | 0.58 | 0.50 | 0.37 | 0.29 | 0.24 | 0.20 | 0.18 | 0.16 | 0.12 | —    | —    | —    |         |  |
| 16                | MGPM         | 0.69        | 0.58 | —    | 0.49 | 0.43 | 0.38 | 0.69 | 0.58 | 0.50 | 0.44 | 0.40 | 0.36 | 0.30 | —    | —    | —    |         |  |
|                   | MGPL/A       | 0.99        | 0.74 | —    | 0.59 | 0.99 | 0.86 | 0.65 | 0.52 | 0.43 | 0.37 | 0.32 | 0.28 | 0.23 | —    | —    | —    |         |  |
| 20                | MGPM         | —           | 1.05 | —    | 0.93 | 0.83 | 0.75 | 1.88 | 1.63 | 1.44 | 1.28 | 1.16 | 1.06 | 0.90 | 0.78 | 0.69 | 0.62 |         |  |
|                   | MGPL/A       | —           | 1.26 | —    | 1.03 | 2.17 | 1.94 | 1.52 | 1.25 | 1.34 | 1.17 | 1.03 | 0.93 | 0.76 | 0.65 | 0.56 | 0.49 |         |  |
| 25                | MGPM         | —           | 1.76 | —    | 1.55 | 1.38 | 1.25 | 2.96 | 2.57 | 2.26 | 2.02 | 1.83 | 1.67 | 1.42 | 1.24 | 1.09 | 0.98 |         |  |
|                   | MGPL/A       | —           | 2.11 | —    | 1.75 | 3.37 | 3.02 | 2.38 | 1.97 | 2.05 | 1.78 | 1.58 | 1.41 | 1.16 | 0.98 | 0.85 | 0.74 |         |  |
| 32                | MGPM         | —           | —    | 6.35 | —    | —    | 5.13 | 5.69 | 4.97 | 4.42 | 3.98 | 3.61 | 3.31 | 2.84 | 2.48 | 2.20 | 1.98 |         |  |
|                   | MGPL/A       | —           | —    | 5.95 | —    | —    | 4.89 | 5.11 | 4.51 | 6.34 | 5.79 | 5.33 | 4.93 | 4.29 | 3.78 | 3.38 | 3.04 |         |  |
| 40                | MGPM         | —           | —    | 7.00 | —    | —    | 5.66 | 6.27 | 5.48 | 4.87 | 4.38 | 3.98 | 3.65 | 3.13 | 2.74 | 2.43 | 2.19 |         |  |
|                   | MGPL/A       | —           | —    | 6.55 | —    | —    | 5.39 | 5.62 | 4.96 | 6.98 | 6.38 | 5.87 | 5.43 | 4.72 | 4.16 | 3.71 | 3.35 |         |  |
| 50                | MGPM         | —           | —    | 13.0 | —    | —    | 10.8 | 12.0 | 10.6 | 9.50 | 8.60 | 7.86 | 7.24 | 6.24 | 5.49 | 4.90 | 4.43 |         |  |
|                   | MGPL/A       | —           | —    | 9.17 | —    | —    | 7.62 | 9.83 | 8.74 | 11.6 | 10.7 | 9.83 | 9.12 | 7.95 | 7.02 | 6.26 | 5.63 |         |  |
| 63                | MGPM         | —           | —    | 14.7 | —    | —    | 12.1 | 13.5 | 11.9 | 10.7 | 9.69 | 8.86 | 8.16 | 7.04 | 6.19 | 5.52 | 4.99 |         |  |
|                   | MGPL/A       | —           | —    | 10.2 | —    | —    | 8.48 | 11.0 | 9.74 | 13.0 | 11.9 | 11.0 | 10.2 | 8.84 | 7.80 | 6.94 | 6.24 |         |  |
| 80                | MGPM         | —           | —    | 21.9 | —    | —    | 18.6 | 22.9 | 20.5 | 18.6 | 17.0 | 15.6 | 14.5 | 12.6 | 11.2 | 10.0 | 9.11 |         |  |
|                   | MGPL/A       | —           | —    | 15.1 | —    | —    | 23.3 | 22.7 | 20.6 | 18.9 | 17.3 | 16.0 | 14.8 | 12.9 | 11.3 | 10.0 | 8.94 |         |  |
| 100               | MGPM         | —           | —    | 38.8 | —    | —    | 33.5 | 37.5 | 33.8 | 30.9 | 28.4 | 26.2 | 24.4 | 21.4 | 19.1 | 17.2 | 15.7 |         |  |
|                   | MGPL/A       | —           | —    | 27.1 | —    | —    | 30.6 | 37.9 | 34.6 | 31.8 | 29.3 | 27.2 | 25.3 | 22.1 | 19.5 | 17.3 | 15.5 |         |  |

## Non-rotating Accuracy of Plate



Non-rotating accuracy  $\theta$  when retracted and when no load is applied should be not more than the values shown in the table.

| Bore size<br>[mm] | Non-rotating accuracy $\theta$ |                  |                  |
|-------------------|--------------------------------|------------------|------------------|
|                   | MGPM                           | MGPL             | MGPA             |
| 12                | $\pm 0.07^\circ$               | $\pm 0.05^\circ$ | $\pm 0.01^\circ$ |
| 16                |                                |                  |                  |
| 20                |                                |                  |                  |
| 25                |                                |                  |                  |
| 32                | $\pm 0.05^\circ$               | $\pm 0.03^\circ$ |                  |
| 40                |                                |                  |                  |
| 50                |                                |                  |                  |
| 63                | $\pm 0.04^\circ$               | $\pm 0.03^\circ$ |                  |
| 80                |                                |                  |                  |
| 100               |                                |                  |                  |

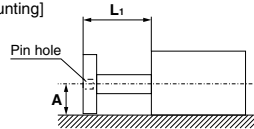
## High Precision Ball Bushing/MGPA

### ⚠ Caution

#### Positioning accuracy for pin hole on the plate

Dispersion of dimensions when machining each component will be accumulated in the plate pin hole positioning accuracy when mounting this cylinder. Values below are referred as a guide.

[Side mounting]

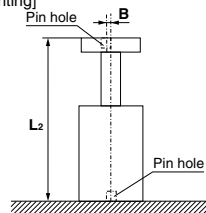


$$A = \text{Catalog dimension} \pm \text{*(0.1 + L1 x 0.0008) [mm]}$$

※: To be 0.15 for  $\phi 80, \phi 100$

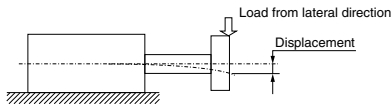
Note) Displacement by load and self-weight deflection by plate and guide rod are not included.

[Bottom mounting]

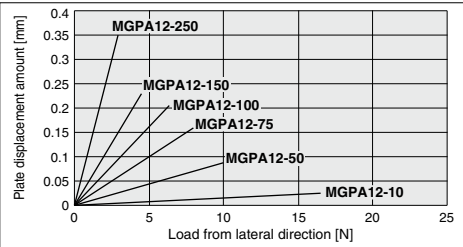


$$B = \pm (0.045 + L2 \times 0.0016) \text{ [mm]}$$

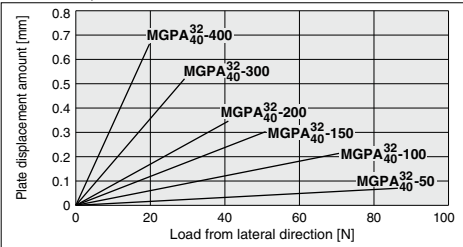
High Precision Ball Bushing/MGPA Plate Displacement Amount (Reference Values)



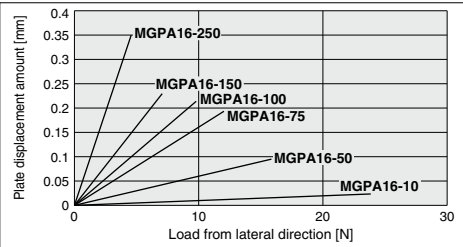
MGPA12



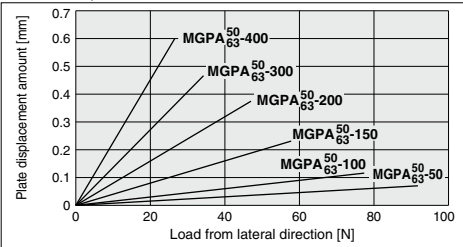
MGPA32, 40



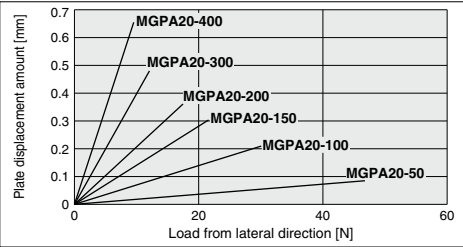
MGPA16



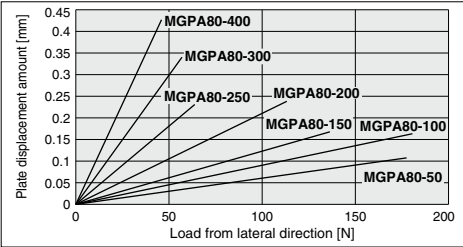
MGPA50, 63



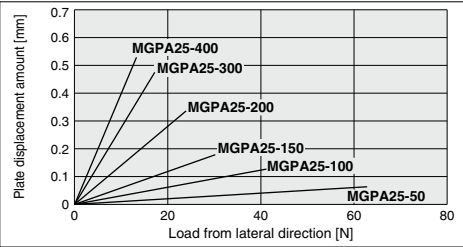
MGPA20



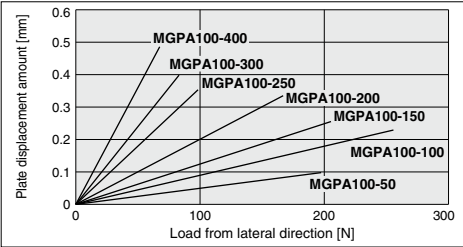
MGPA80



MGPA25



MGPA100



※: The guide rod and self-weight for the plate are not included in the above displacement values.  
※: Allowable rotating torque, and operating range when used as a lifter, are the same as those of the MGPL series.

# Basic Type MGP Series Model Selection

## Selection Conditions

| Mounting orientation  | Vertical    |             | Horizontal  |            |
|-----------------------|-------------|-------------|-------------|------------|
|                       |             |             |             |            |
| Maximum speed [mm/s]  | 200 or less | 400         | 200 or less | 400        |
| Graph (Slide bearing) | (1), (2)    | (3), (4)    | (13), (14)  | (15), (16) |
| Graph (Ball bushing)  | (5) to (8)  | (9) to (12) | (17), (18)  | (19), (20) |

### Selection Example 1 (Vertical Mounting)

#### Selection conditions

Mounting: Vertical  
Bearing type: Ball bushing  
Stroke: 30 stroke  
Maximum speed: 200 mm/s  
Load mass: 3 kg  
Eccentric distance: 90 mm

Find the point of intersection for the load mass of 3 kg and the eccentric distance of 90 mm on graph (5), based on vertical mounting, ball bushing, 30 stroke, and the speed of 200 mm/s.

→ **MGPL25-30Z** is selected.

### Selection Example 2 (Horizontal Mounting)

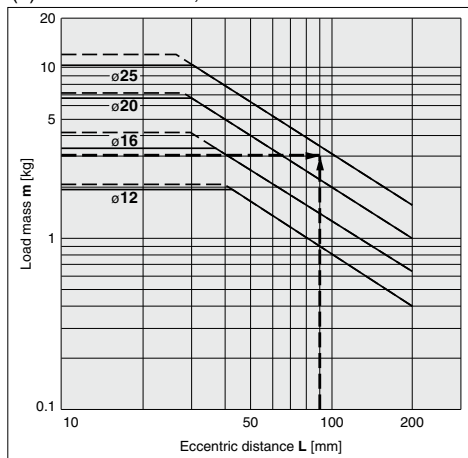
#### Selection conditions

Mounting: Horizontal  
Bearing type: Slide bearing  
Distance between plate and load center of gravity: 50 mm  
Maximum speed: 200 mm/s  
Load mass: 2 kg  
Stroke: 30 stroke

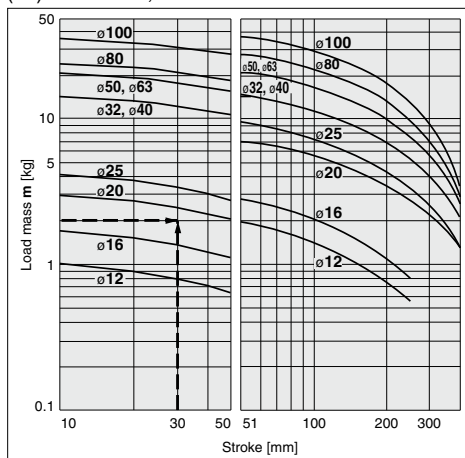
Find the point of intersection for the load mass of 2 kg and 30 stroke on graph (13), based on horizontal mounting, slide bearing, the distance of 50 mm between the plate and load center of gravity, and the speed of 200 mm/s.

→ **MGPM20-30Z** is selected.

(5) 30 stroke or less,  $V = 200$  mm/s or less



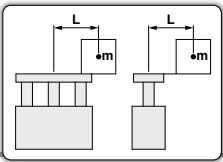
(13)  $L = 50$  mm,  $V = 200$  mm/s or less



When the maximum speed exceeds 200 mm/s, the allowable load mass is determined by multiplying the value shown in the graph at 400 mm/s by the coefficient listed in the table below.

| Max. speed  | Up to 300 mm/s | Up to 400 mm/s | Up to 500 mm/s |
|-------------|----------------|----------------|----------------|
| Coefficient | 1.7            | 1              | 0.6            |

Use the Guide Cylinder Selection Software, when the eccentric distance is 200 mm or more.

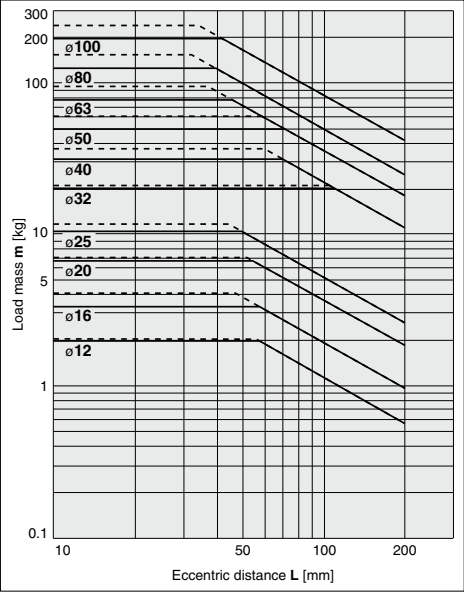


Vertical Mounting **Slide Bearing**

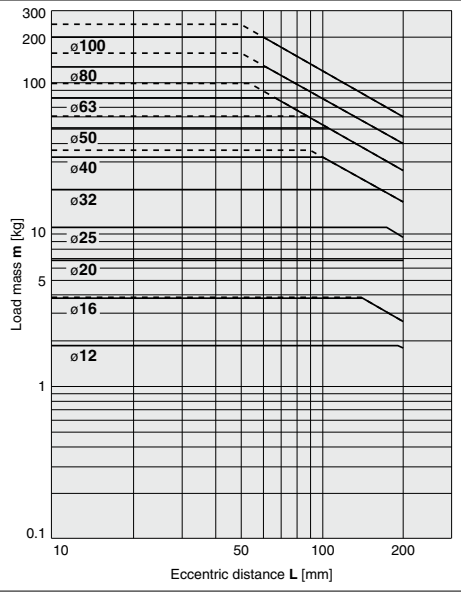
— Operating pressure 0.4 MPa  
- - - Operating pressure 0.5 MPa or more

MGPM12 to 100

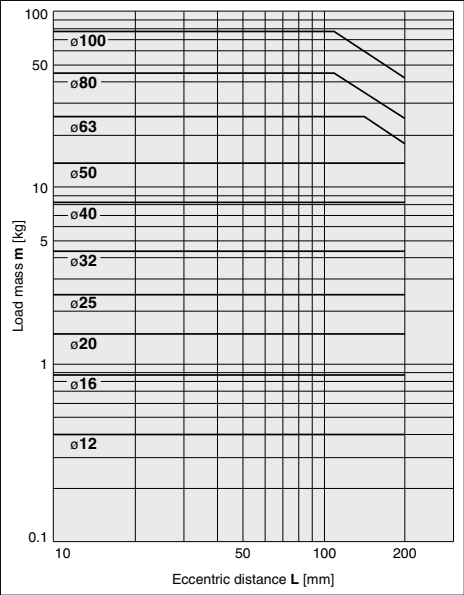
(1) 50 stroke or less,  $V = 200 \text{ mm/s}$  or less



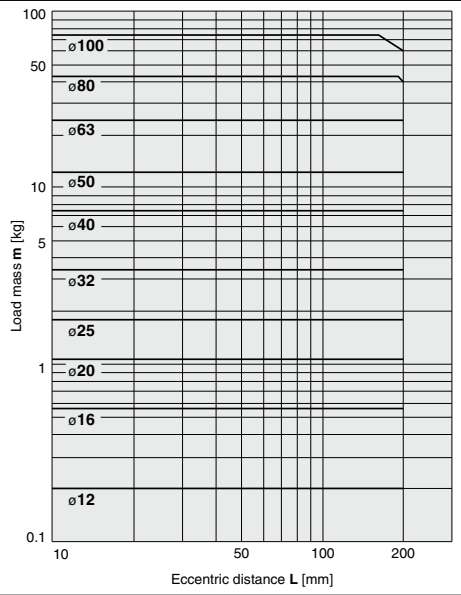
(2) Over 50 stroke,  $V = 200 \text{ mm/s}$  or less



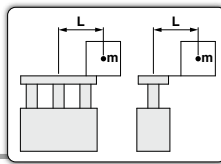
(3) 50 stroke or less,  $V = 400 \text{ mm/s}$



(4) Over 50 stroke,  $V = 400 \text{ mm/s}$



· Use the Guide Cylinder Selection Software, when the eccentric distance is 200 mm or more.



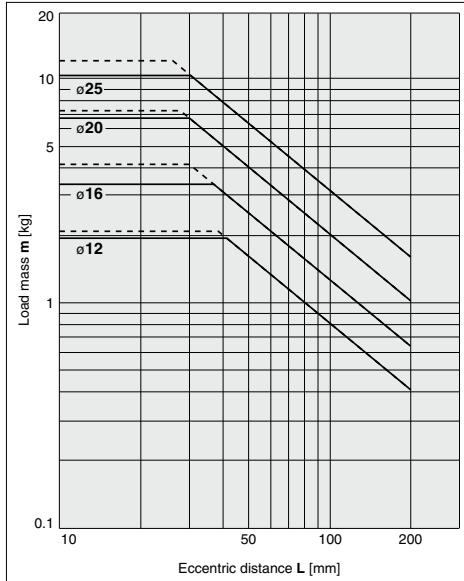
## Model Selection **MGP Series**

### Vertical Mounting **Ball Bushing**

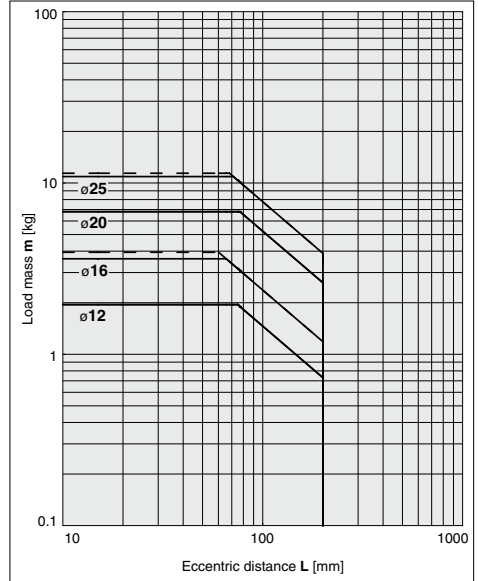
— Operating pressure 0.4 MPa  
 - - - - - Operating pressure 0.5 MPa or more

#### MGPL12 to 25, MGPA12 to 25

(5) 30 stroke or less,  $V = 200$  mm/s or less

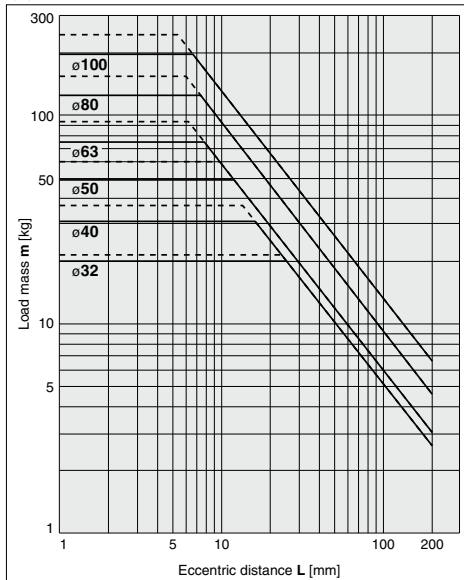


(6) Over 30 stroke,  $V = 200$  mm/s or less

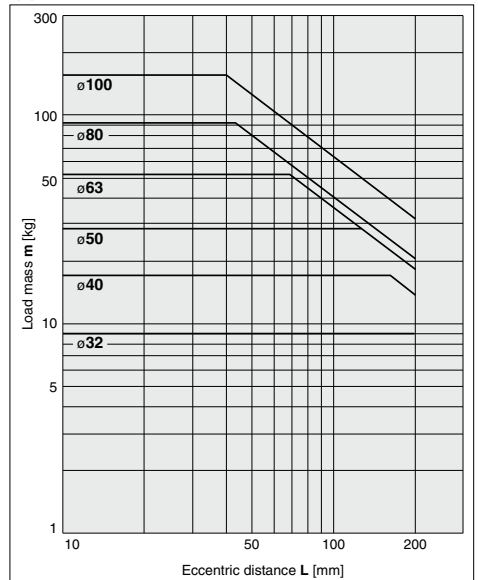


#### MGPL32 to 100, MGPA32 to 100

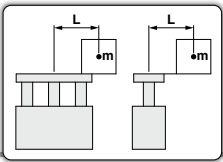
(7) 50 stroke or less,  $V = 200$  mm/s or less



(8) Over 50 stroke,  $V = 200$  mm/s or less



· Use the Guide Cylinder Selection Software, when the eccentric distance is 200 mm or more.

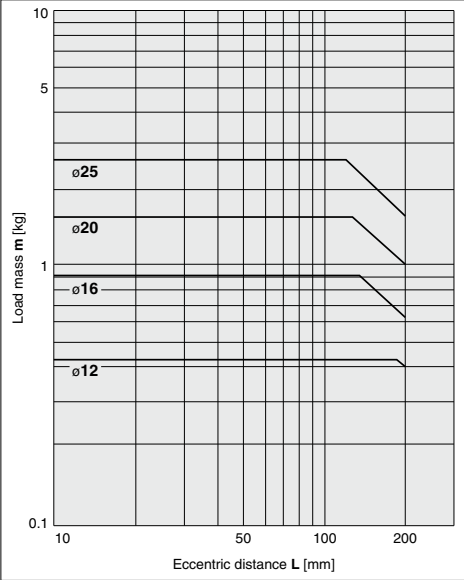


Vertical Mounting **Ball Bushing**

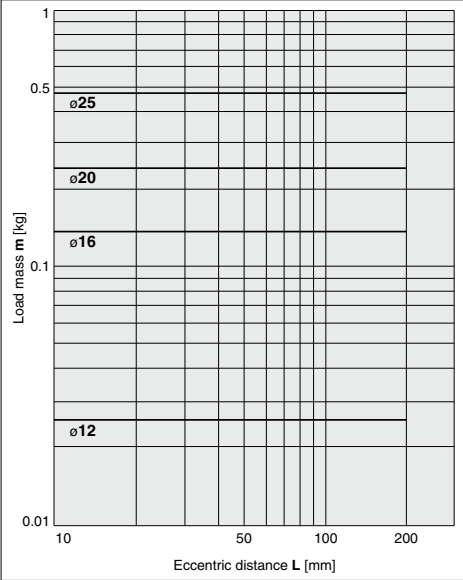
Operating pressure 0.4 MPa

**MGPL12 to 25, MGPA12 to 25**

(9) 30 stroke or less,  $V = 400 \text{ mm/s}$

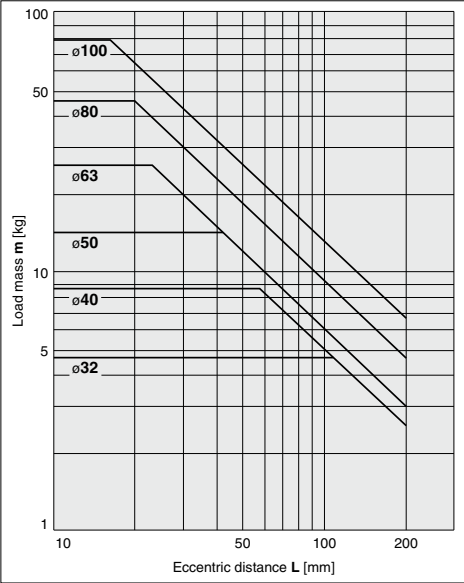


(10) Over 30 stroke,  $V = 400 \text{ mm/s}$

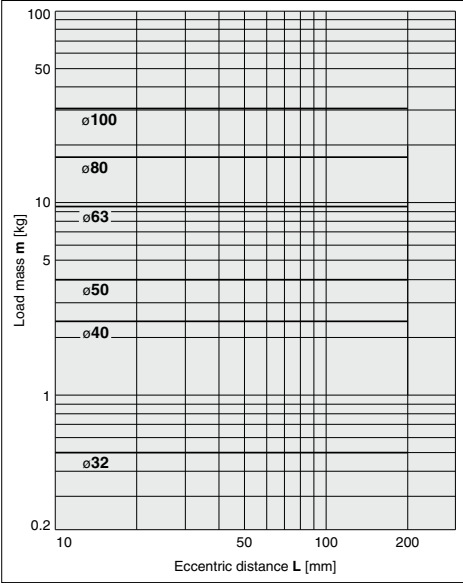


**MGPL32 to 100, MGPA32 to 100**

(11) 50 stroke or less,  $V = 400 \text{ mm/s}$

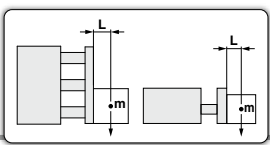


(12) Over 50 stroke,  $V = 400 \text{ mm/s}$



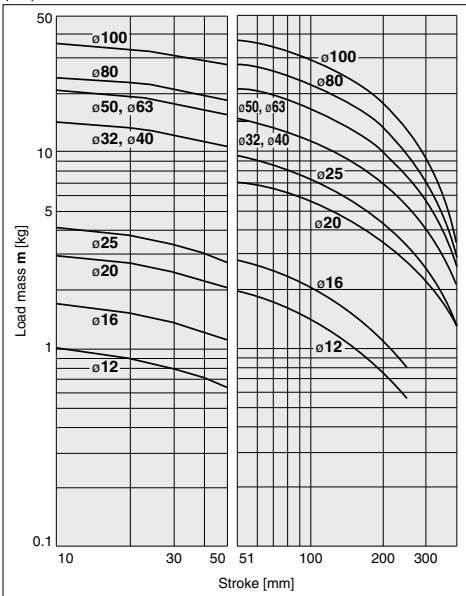
· Use the Guide Cylinder Selection Software, when the eccentric distance is 200 mm or more.

**Horizontal Mounting** **Slide Bearing**

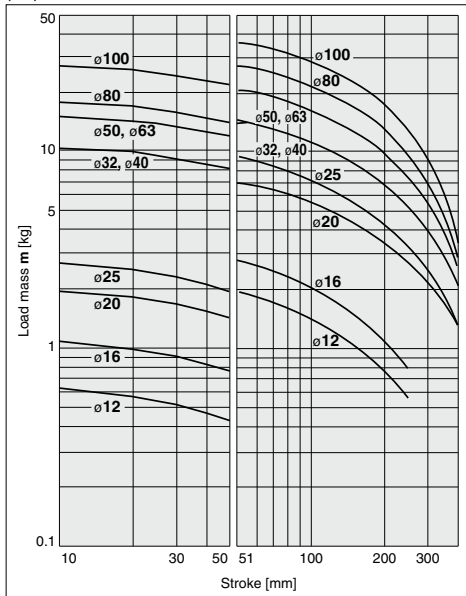


**MGPM12 to 100**

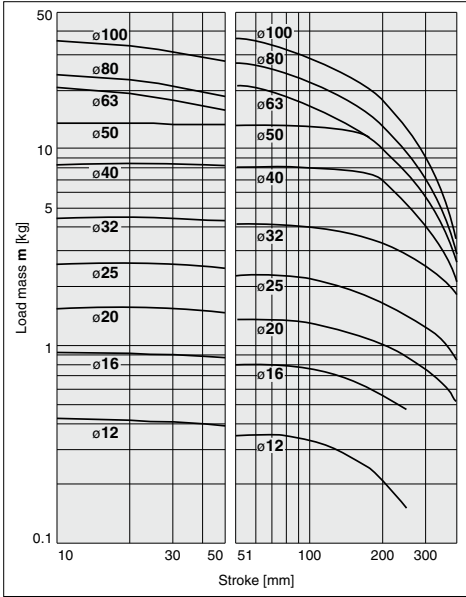
(13) L = 50 mm, V = 200 mm/s or less



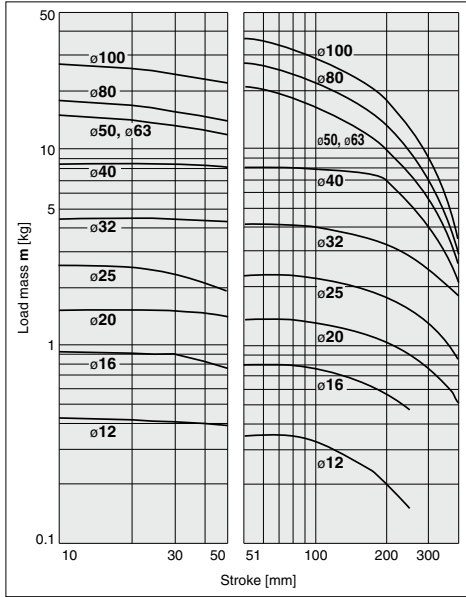
(14) L = 100 mm, V = 200 mm/s or less



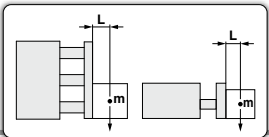
(15) L = 50 mm, V = 400 mm/s



(16) L = 100 mm, V = 400 mm/s



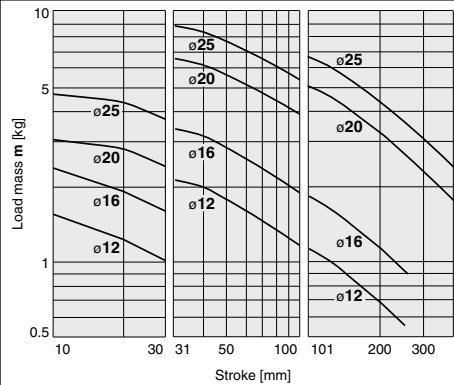
# MGP Series



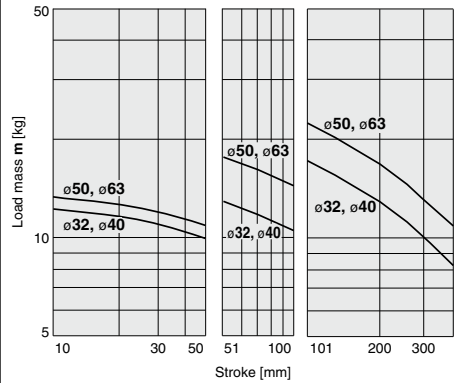
## Horizontal Mounting **Ball Bushing**

(17) L = 50 mm, V = 200 mm/s or less

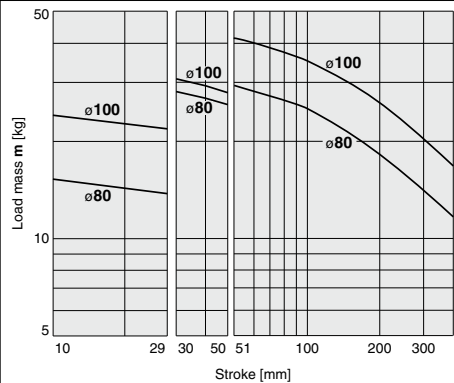
### MGPL12 to 25, MGPA12 to 25



### MGPL32 to 63, MGPA32 to 63

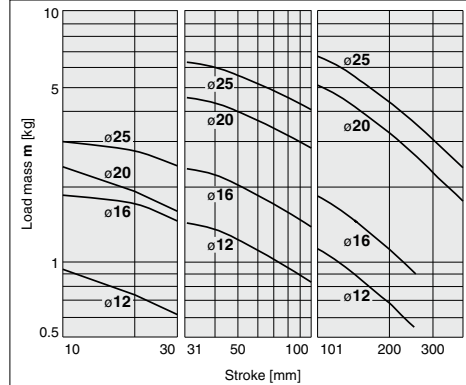


### MGPL80/100, MGPA80/100

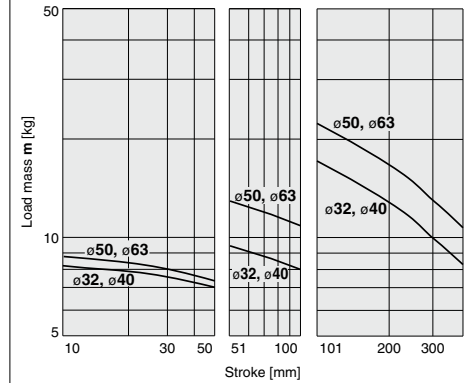


(18) L = 100 mm, V = 200 mm/s or less

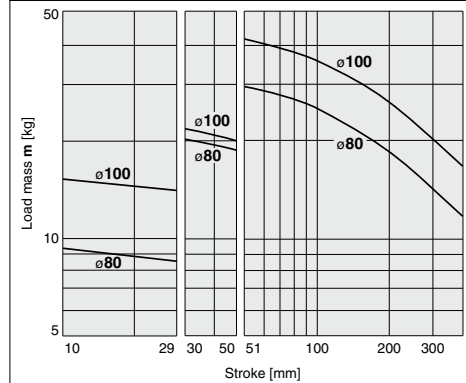
### MGPL12 to 25, MGPA12 to 25

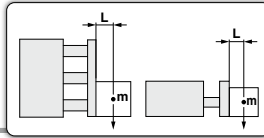


### MGPL32 to 63, MGPA32 to 63



### MGPL80/100, MGPA80/100

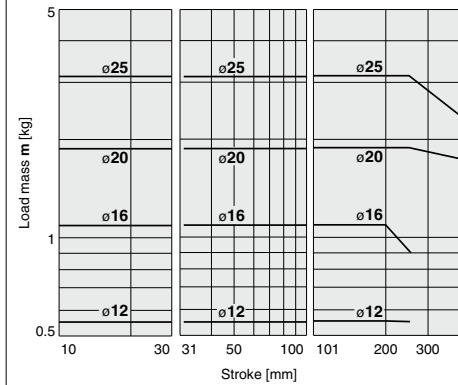




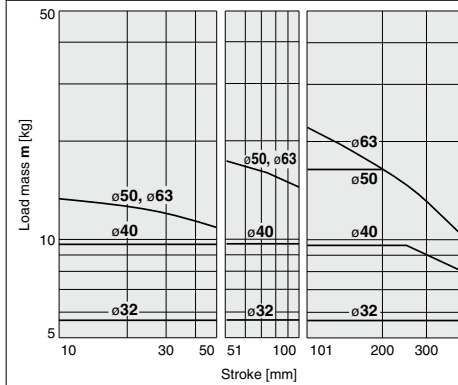
**Horizontal Mounting Ball Bushing**

(19) L = 50 mm, V = 400 mm/s

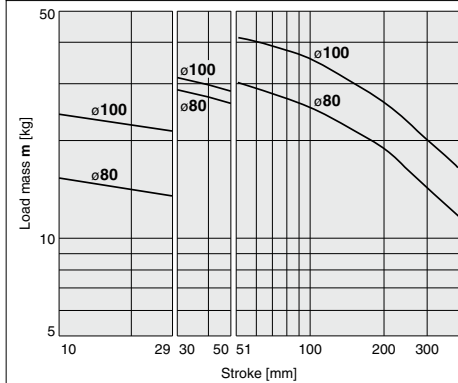
**MGPL12 to 25, MGPA12 to 25**



**MGPL32 to 63, MGPA32 to 63**

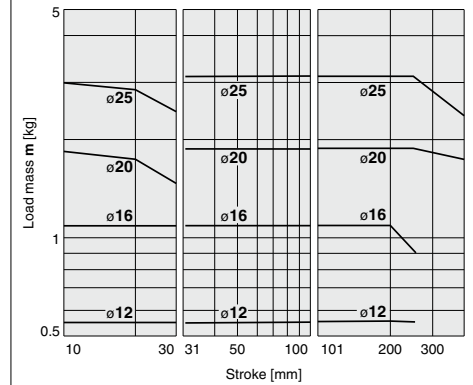


**MGPL80/100, MGPA80/100**

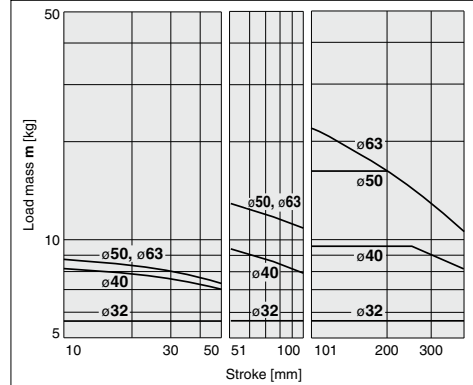


(20) L = 100 mm, V = 400 mm/s

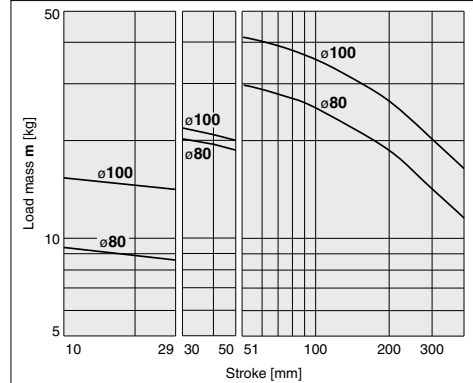
**MGPL12 to 25, MGPA12 to 25**



**MGPL32 to 63, MGPA32 to 63**

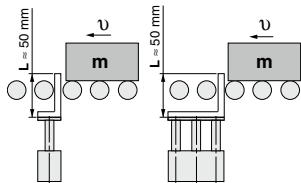


**MGPL80/100, MGPA80/100**



## Operating Range when Used as Stopper

Bore Size:  $\phi 12$  to  $\phi 25$ /MGPM12 to 25 (Slide Bearing)



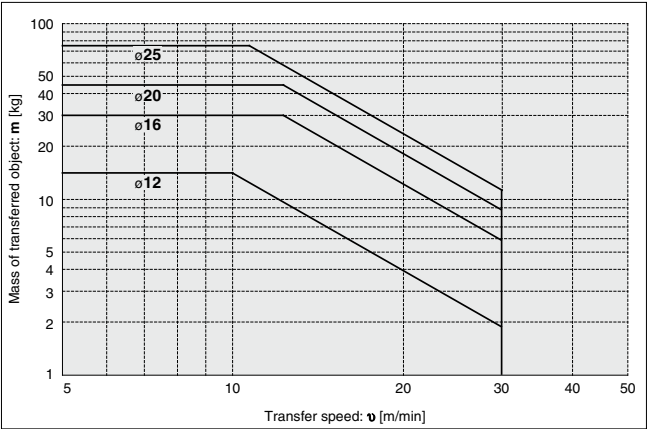
※: When selecting a model with a longer L dimension, be sure to choose a bore size which is sufficiently large.

### ⚠ Caution

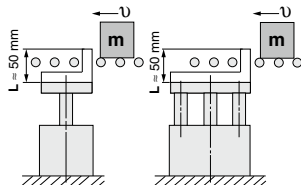
#### Caution on handling

1. When using as a stopper, select a model with 30 stroke or less.
2. The MGPL (Ball bushing) and the MGPA (High precision ball bushing) cannot be used as a stopper.

MGPM12 to 25 (Slide Bearing)



Bore Size:  $\phi 32$  to  $\phi 100$ /MGPM32 to 100 (Slide Bearing)



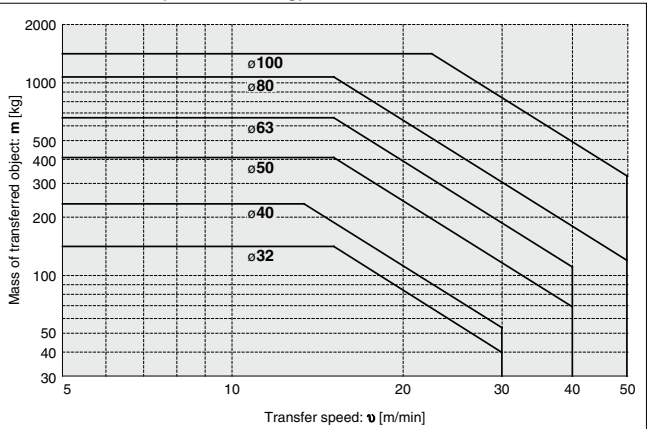
※: When selecting a model with a longer L dimension, be sure to choose a bore size which is sufficiently large.

### ⚠ Caution

#### Caution on handling

1. When using as a stopper, select a model with 50 stroke or less.
2. The MGPL (Ball bushing) and the MGPA (High precision ball bushing) cannot be used as a stopper.

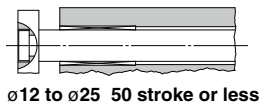
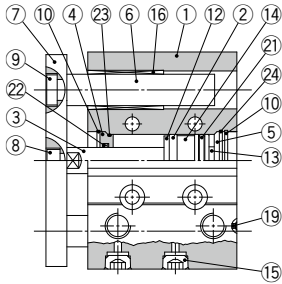
MGPM32 to 100 (Slide Bearing)



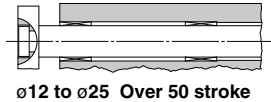
※: Refer to graphs (13) and (15) if line pressure is applied by a roller conveyor after the workpiece is stopped.

## Construction/MGPM Series

### MGPM12 to 25

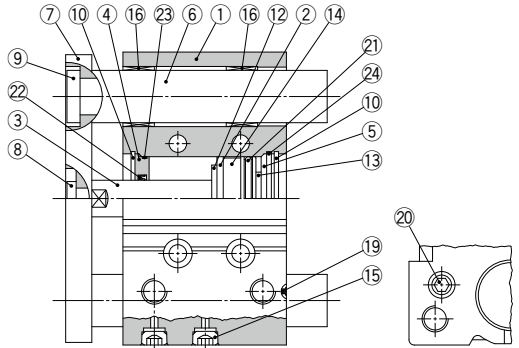


ø12 to ø25 50 stroke or less

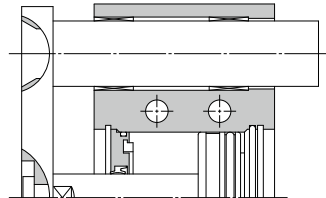


ø12 to ø25 Over 50 stroke

### MGPM32 to 100



ø63 or more



ø50 or more

## Component Parts

| No. | Description              | Material          | Note                                           |
|-----|--------------------------|-------------------|------------------------------------------------|
| 1   | Body                     | Aluminum alloy    | Hard anodized                                  |
| 2   | Piston                   | Aluminum alloy    |                                                |
| 3   | Piston rod               | Stainless steel   | ø12 to ø25                                     |
| 4   | Collar                   | Carbon steel      | ø32 to ø100   Hard chrome plating              |
| 5   | Head cover               | Aluminum alloy    | Chromated<br>ø12 to ø63   Painted<br>ø80, ø100 |
| 6   | Guide rod                | Carbon steel      | Hard chrome plating                            |
| 7   | Plate                    | Carbon steel      | Nickel plating                                 |
| 8   | Plate mounting bolt      | Carbon steel      | Nickel plating                                 |
| 9   | Guide bolt               | Carbon steel      | Nickel plating                                 |
| 10  | Retaining ring           | Carbon tool steel | Phosphate coated                               |
| 11  | Retaining ring           | Carbon tool steel | Phosphate coated                               |
| 12  | Bumper A                 | Urethane          |                                                |
| 13  | Bumper B                 | Urethane          |                                                |
| 14  | Magnet                   | —                 |                                                |
| 15  | Plug                     | Carbon steel      | ø12, ø16<br>ø20 to ø100   Nickel plating       |
| 16  | Hexagon socket head plug | Carbon steel      | ø20 to ø100   Nickel plating                   |
| 17  | Slide bearing            | Bearing alloy     |                                                |

※: A felt is not installed on the slide bearing.

## Component Parts

| No. | Description  | Material       | Note                         |
|-----|--------------|----------------|------------------------------|
| 17  | Ball bushing | Aluminum alloy |                              |
| 18  | Spacer       | Aluminum alloy |                              |
| 19  | Steel ball   | Carbon steel   | ø12 to ø50                   |
| 20  | Plug         | Carbon steel   | ø63 to ø100   Nickel plating |
| 21* | Piston seal  | NBR            |                              |
| 22* | Rod seal     | NBR            |                              |
| 23* | Gasket A     | NBR            |                              |
| 24* | Gasket B     | NBR            |                              |

## Replacement Parts/Seal Kit

| Bore size [mm] | Kit no.    | Contents       | Bore size [mm] | Kit no.     | Contents       |
|----------------|------------|----------------|----------------|-------------|----------------|
| 12             | MGP12-Z-PS | Set of nos.    | 40             | MGP40-Z-PS  | Set of nos.    |
| 16             | MGP16-Z-PS | above          | 50             | MGP50-Z-PS  | above          |
| 20             | MGP20-Z-PS | above          | 63             | MGP63-Z-PS  | above          |
| 25             | MGP25-Z-PS | ②1, ②2, ②3, ②4 | 80             | MGP80-Z-PS  | ②1, ②2, ②3, ②4 |
| 32             | MGP32-Z-PS | ②3, ②4         | 100            | MGP100-Z-PS | ②3, ②4         |

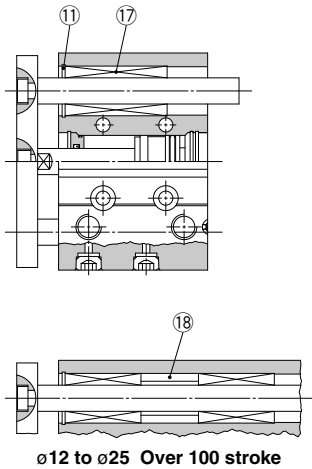
※: Seal kit includes ②1 to ②4. Order the seal kit, based on each bore size.

※: Since the seal kit does not include a grease pack, order it separately.

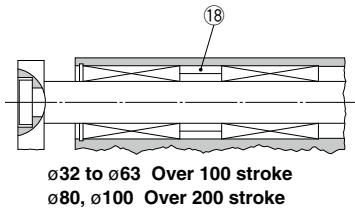
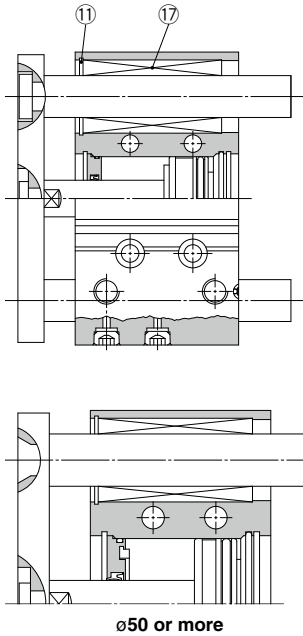
Grease pack part number: GR-S-010 (10 g)

Construction/MGPL Series, MGPA Series

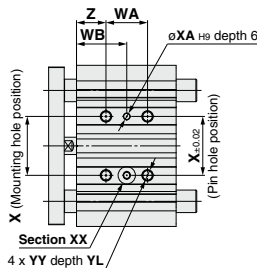
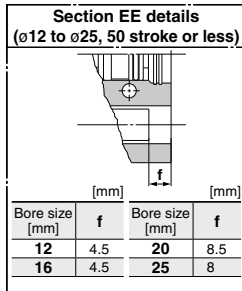
MGPL12 to 25  
MGPA12 to 25



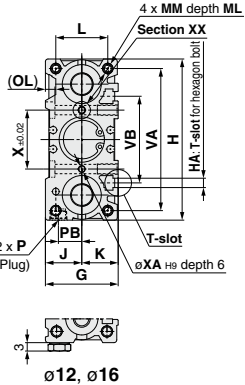
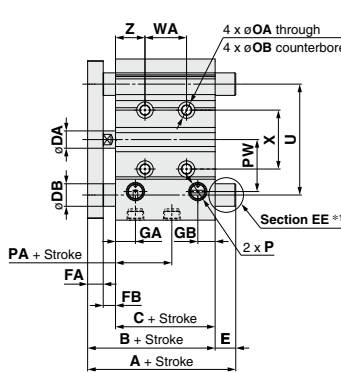
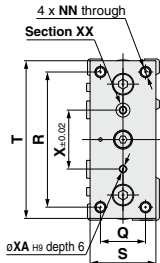
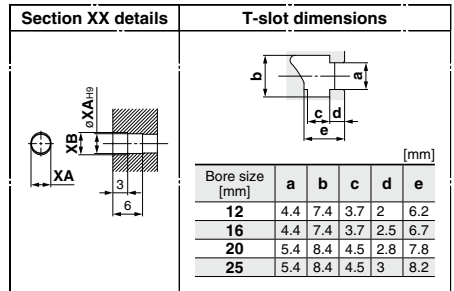
MGPL32 to 100  
MGPA32 to 100



# ø12 to ø25/MGPM, MGPL, MGPA



Bottom view



\*1: Refer to Section EE details for the shape of ø12 to ø25 with stroke of 50 or less.

\*: The use of a slot (width XA, length XB, depth 3) allows for a relaxed pin pitch tolerance, with the pin hole (øXA Hø, depth 6) as the reference, without affecting mounting accuracy.

\*: For intermediate strokes other than standard strokes, refer to Manufacture of Intermediate Strokes on page 537.

\*: For bore size ø12 and ø16, only M5 x 0.8 port is available.

\*: For bore size ø20 or more, choice of Rc, NPT, G port is available. (Refer to page 536.)

## MGPM, MGPL, MGPA Common Dimensions

[mm]

| Bore size<br>[mm] | Standard stroke [mm]              | B    | C    | DA | FA | FB | G  | GA   | GB  | H  | HA | J  | K  | L  | MM       | ML | NN       | OA  | OB  | OL  | P        |        |      |
|-------------------|-----------------------------------|------|------|----|----|----|----|------|-----|----|----|----|----|----|----------|----|----------|-----|-----|-----|----------|--------|------|
|                   |                                   |      |      |    |    |    |    |      |     |    |    |    |    |    |          |    |          |     |     |     | Nil      | TN     | TF   |
| 12                | 10, 20, 30, 40, 50, 75, 100       | 42   | 29   | 6  | 7  | 6  | 26 | 10   | 7   | 58 | M4 | 13 | 13 | 18 | M4 x 0.7 | 10 | M4 x 0.7 | 4.3 | 8   | 4.5 | M5 x 0.8 | —      | —    |
| 16                | 125, 150, 175, 200, 250           | 46   | 33   | 8  | 7  | 6  | 30 | 10.5 | 7.5 | 64 | M4 | 15 | 15 | 22 | M5 x 0.8 | 12 | M5 x 0.8 | 4.3 | 8   | 4.5 | M5 x 0.8 | —      | —    |
| 20                | 20, 30, 40, 50, 75, 100, 125, 150 | 53   | 37   | 10 | 8  | 8  | 36 | 11.5 | 9   | 83 | M5 | 18 | 18 | 24 | M5 x 0.8 | 13 | M5 x 0.8 | 5.4 | 9.5 | 5.5 | Rc1/8    | NPT1/8 | G1/8 |
| 25                | 175, 200, 250, 300, 350, 400      | 53.5 | 37.5 | 10 | 9  | 7  | 42 | 11.5 | 10  | 93 | M5 | 21 | 21 | 30 | M6 x 1.0 | 15 | M6 x 1.0 | 5.4 | 9.5 | 5.5 | Rc1/8    | NPT1/8 | G1/8 |

| Bore size<br>[mm] | PA   | PB   | PW | Q  | R  | S  | T  | U  | VA | VB | WA            |                           |                            |                            | WB            |                           |                            |                            | X   | XA  | XB | YY | YL  | Z        |    |    |
|-------------------|------|------|----|----|----|----|----|----|----|----|---------------|---------------------------|----------------------------|----------------------------|---------------|---------------------------|----------------------------|----------------------------|-----|-----|----|----|-----|----------|----|----|
|                   |      |      |    |    |    |    |    |    |    |    | 30 st or less | Over 30 at 100 st or less | Over 100 at 200 st or less | Over 200 at 300 st or less | 30 st or less | Over 30 at 100 st or less | Over 100 at 200 st or less | Over 200 at 300 st or less |     |     |    |    |     |          |    |    |
| 12                | 13   | 8    | 18 | 14 | 48 | 22 | 56 | 41 | 50 | 37 | 20            | 40                        | 110                        | 200                        | —             | 15                        | 25                         | 60                         | 105 | —   | 23 | 3  | 3.5 | M5 x 0.8 | 10 | 5  |
| 16                | 14.5 | 10   | 19 | 16 | 54 | 25 | 62 | 46 | 56 | 38 | 24            | 44                        | 110                        | 200                        | —             | 17                        | 27                         | 60                         | 105 | —   | 24 | 3  | 3.5 | M5 x 0.8 | 10 | 5  |
| 20                | 13.5 | 10.5 | 25 | 18 | 70 | 30 | 81 | 54 | 72 | 44 | 24            | 44                        | 120                        | 200                        | 300           | 29                        | 39                         | 77                         | 117 | 167 | 28 | 3  | 3.5 | M6 x 1.0 | 12 | 17 |
| 25                | 12.5 | 13.5 | 30 | 26 | 78 | 38 | 91 | 64 | 82 | 50 | 24            | 44                        | 120                        | 200                        | 300           | 29                        | 39                         | 77                         | 117 | 167 | 34 | 4  | 4.5 | M6 x 1.0 | 12 | 17 |

## MGPL (Ball bushing)

## MGPM (Slide bearing) A, DB, E Dimensions

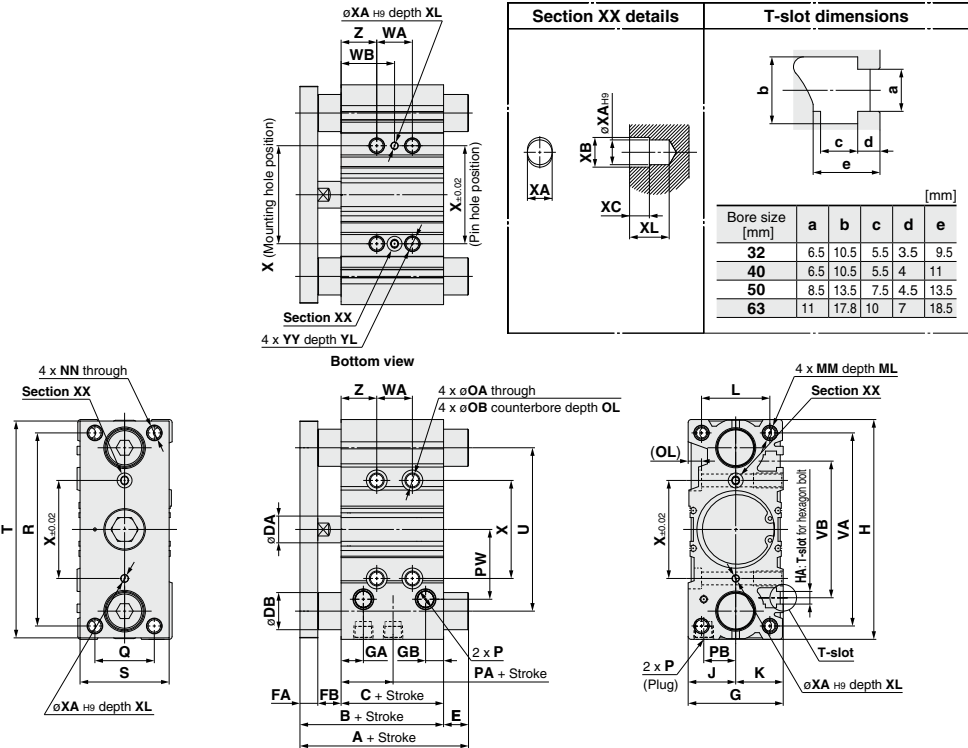
[mm]

| Bore size [mm] | A             |                           |                            |             | DB | E             |                           |                            |             |
|----------------|---------------|---------------------------|----------------------------|-------------|----|---------------|---------------------------|----------------------------|-------------|
|                | 50 st or less | Over 50 at 100 st or less | Over 100 at 200 st or less | Over 200 st |    | 50 st or less | Over 50 at 100 st or less | Over 100 at 200 st or less | Over 200 st |
| 12             | 42            | 60.5                      | 82.5                       | 82.5        | 8  | 0             | 18.5                      | 40.5                       | 40.5        |
| 16             | 46            | 64.5                      | 92.5                       | 92.5        | 10 | 0             | 18.5                      | 46.5                       | 46.5        |
| 20             | 53            | 77.5                      | 110                        | 110         | 12 | 0             | 24.5                      | 24.5                       | 57          |
| 25             | 53.5          | 77.5                      | 109.5                      | 109.5       | 16 | 0             | 24                        | 24                         | 56          |

## MGPA (High precision ball bushing) A, DB, E Dimensions [mm]

| Bore size [mm] | A             |                           |                            |             | DB | E             |                           |                            |             |
|----------------|---------------|---------------------------|----------------------------|-------------|----|---------------|---------------------------|----------------------------|-------------|
|                | 30 st or less | Over 30 at 100 st or less | Over 100 at 200 st or less | Over 200 st |    | 30 st or less | Over 30 at 100 st or less | Over 100 at 200 st or less | Over 200 st |
| 12             | 43            | 55                        | 84.5                       | 84.5        | 6  | 1             | 13                        | 42.5                       | 42.5        |
| 16             | 49            | 65                        | 94.5                       | 94.5        | 8  | 3             | 19                        | 48.5                       | 48.5        |
| 20             | 59            | 76                        | 100                        | 117.5       | 10 | 6             | 23                        | 47                         | 64.5        |
| 25             | 65.5          | 81.5                      | 100.5                      | 117.5       | 13 | 12            | 28                        | 47                         | 64          |

ø32 to ø63/MGPM, MGPL, MGPA



\*: The use of a slot (width XA, length XB, depth XC) allows for a relaxed pin pitch tolerance, with the pin hole (øXA<sub>H9</sub>, depth XL) as the reference, without affecting mounting accuracy.

\*: For intermediate strokes other than standard strokes, refer to Manufacture of Intermediate Strokes on page 537.

\*: Choice of Rc, NPT, G port is available. (Refer to page 536.)

MGPM, MGPL, MGPA Common Dimensions [mm]

| Bore size [mm] | Standard stroke [mm] | B    | C    | DA | FA | FB | G  | GA   | GB   | H   | HA  | J  | K  | L  | MM        | ML | NN        | OA  | OB | OL  | P     |        |      |
|----------------|----------------------|------|------|----|----|----|----|------|------|-----|-----|----|----|----|-----------|----|-----------|-----|----|-----|-------|--------|------|
|                |                      |      |      |    |    |    |    |      |      |     |     |    |    |    |           |    |           |     |    |     | Nil   | TN     | TF   |
| 32             | 25, 50, 75           | 59.5 | 37.5 | 14 | 10 | 12 | 48 | 12   | 9    | 112 | M6  | 24 | 24 | 34 | M8 x 1.25 | 20 | M8 x 1.25 | 6.7 | 11 | 7.5 | Rc1/8 | NPT1/8 | G1/8 |
| 40             | 100, 125, 150        | 66   | 44   | 14 | 10 | 12 | 54 | 15   | 12   | 120 | M6  | 27 | 27 | 40 | M8 x 1.25 | 20 | M8 x 1.25 | 6.7 | 11 | 7.5 | Rc1/8 | NPT1/8 | G1/8 |
| 50             | 175, 200, 250        | 72   | 44   | 18 | 12 | 16 | 64 | 15   | 12   | 148 | M8  | 32 | 32 | 46 | M10 x 1.5 | 22 | M10 x 1.5 | 8.6 | 14 | 9   | Rc1/4 | NPT1/4 | G1/4 |
| 63             | 300, 350, 400        | 77   | 49   | 18 | 12 | 16 | 78 | 15.5 | 13.5 | 162 | M10 | 39 | 39 | 58 | M10 x 1.5 | 22 | M10 x 1.5 | 8.6 | —  | 9   | Rc1/4 | NPT1/4 | G1/4 |

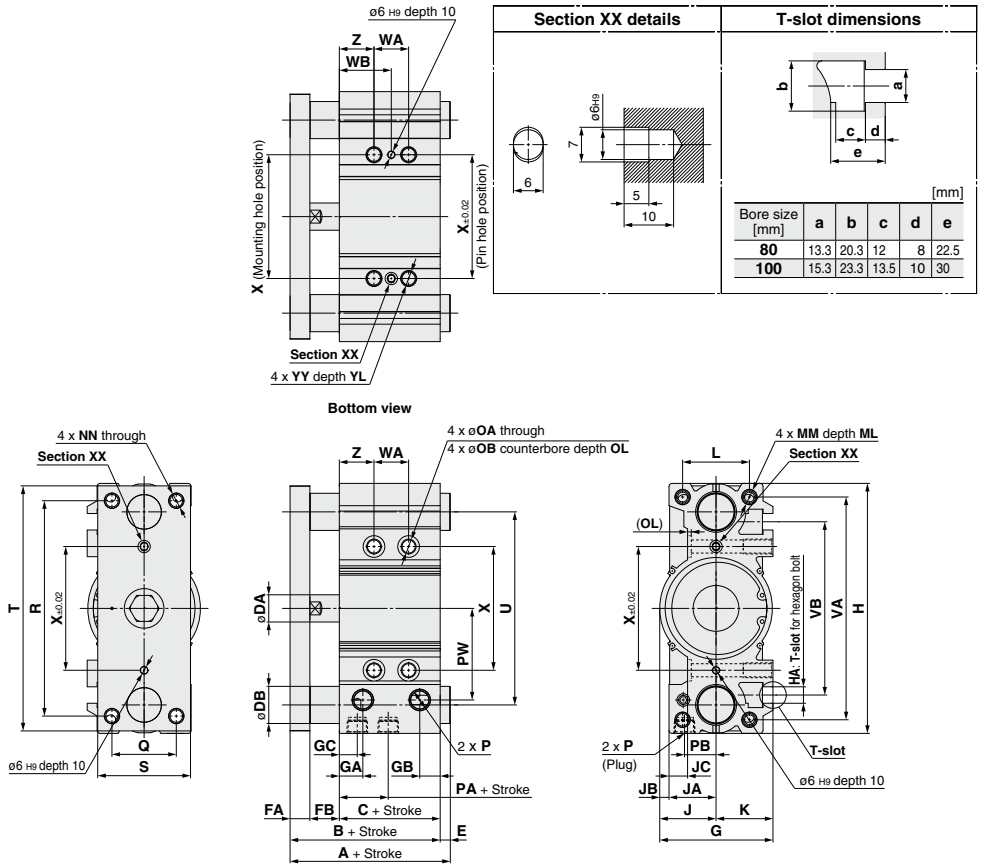
| Bore size<br>[mm] | PA  | PB   | PW   | Q  | R   | S  | T   | U   | VA  | VB  | WA               |                       |                        |                        |             | WB               |                       |                        |                        |             | X  | XA | XB  | XC | XL | YY        | YL | Z  |
|-------------------|-----|------|------|----|-----|----|-----|-----|-----|-----|------------------|-----------------------|------------------------|------------------------|-------------|------------------|-----------------------|------------------------|------------------------|-------------|----|----|-----|----|----|-----------|----|----|
|                   |     |      |      |    |     |    |     |     |     |     | 25 at<br>or less | Over 25<br>at or less | Over 100<br>at or less | Over 200<br>at or less | Over<br>300 | 25 at<br>or less | Over 25<br>at or less | Over 100<br>at or less | Over 200<br>at or less | Over<br>300 |    |    |     |    |    |           |    |    |
| 32                | 6.5 | 16   | 35.5 | 30 | 96  | 44 | 110 | 78  | 98  | 63  | 24               | 48                    | 124                    | 200                    | 300         | 33               | 45                    | 83                     | 121                    | 171         | 42 | 4  | 4.5 | 3  | 6  | M8 x 1.25 | 16 | 21 |
| 40                | 13  | 18   | 39.5 | 30 | 104 | 44 | 118 | 86  | 106 | 72  | 24               | 48                    | 124                    | 200                    | 300         | 34               | 46                    | 84                     | 122                    | 172         | 50 | 4  | 4.5 | 3  | 6  | M8 x 1.25 | 16 | 22 |
| 50                | 9   | 21.5 | 47   | 40 | 130 | 60 | 146 | 110 | 130 | 92  | 24               | 48                    | 124                    | 200                    | 300         | 36               | 48                    | 86                     | 124                    | 174         | 66 | 5  | 6   | 4  | 8  | M10 x 1.5 | 20 | 24 |
| 63                | 13  | 28   | 58   | 50 | 130 | 70 | 158 | 124 | 142 | 110 | 28               | 52                    | 128                    | 200                    | 300         | 38               | 50                    | 88                     | 124                    | 174         | 80 | 5  | 6   | 4  | 8  | M10 x 1.5 | 20 | 24 |

MGPM (Slide bearing) A, DB, E Dimensions [mm] MGPA (High precision ball bushing) A, DB, E Dimensions [mm]

| Bore size [mm] | A             |                    |             | DB | E             |                    |             |
|----------------|---------------|--------------------|-------------|----|---------------|--------------------|-------------|
|                | 50 at or less | Over 50 at or less | Over 200 at |    | 50 at or less | Over 50 at or less | Over 200 at |
| 32             | 75            | 93.5               | 129.5       | 20 | 15.5          | 34                 | 70          |
| 40             | 75            | 93.5               | 129.5       | 20 | 9             | 27.5               | 63.5        |
| 50             | 88.5          | 109.5              | 150.5       | 25 | 16.5          | 37.5               | 78.5        |
| 63             | 88.5          | 109.5              | 150.5       | 25 | 11.5          | 32.5               | 73.5        |

| Bore size [mm] | A             |                    |                     | DB | E             |                    |                     |
|----------------|---------------|--------------------|---------------------|----|---------------|--------------------|---------------------|
|                | 50 at or less | Over 50 at or less | Over 100 at or less |    | 50 at or less | Over 50 at or less | Over 100 at or less |
| 32             | 79.5          | 96.5               | 116.5               | 16 | 20            | 37                 | 79                  |
| 40             | 79.5          | 96.5               | 116.5               | 16 | 13.5          | 30.5               | 72.5                |
| 50             | 91.5          | 112.5              | 132.5               | 20 | 19.5          | 40.5               | 87.5                |
| 63             | 91.5          | 112.5              | 132.5               | 20 | 14.5          | 35.5               | 82.5                |

# ø80, ø100/MGPM, MGPL, MGPA



- \*: The use of a slot (width X6, length 7, depth 5) allows for a relaxed pin pitch tolerance, with the pin hole (ø6H9, depth 10) as the reference, without affecting mounting accuracy.
- \*: For intermediate strokes other than standard strokes, refer to Manufacture of Intermediate Strokes on page 537.
- \*: Choice of Rc, NPT, G port is available. (Refer to page 536.)

## MGPM, MGPL, MGPA Common Dimensions

| Bore size<br>[mm] | Standard<br>stroke [mm]                                     | B    | C    | DA | FA | FB | G     | GA   | GB   | GC   | H   | HA  | J    | JA | JB   | JC | K  | L  | MM         | ML | NN         | OA   | OB   | OL | P     |        |      |
|-------------------|-------------------------------------------------------------|------|------|----|----|----|-------|------|------|------|-----|-----|------|----|------|----|----|----|------------|----|------------|------|------|----|-------|--------|------|
|                   |                                                             |      |      |    |    |    |       |      |      |      |     |     |      |    |      |    |    |    |            |    |            |      |      |    | Nil   | TN     | TF   |
|                   |                                                             |      |      |    |    |    |       |      |      |      |     |     |      |    |      |    |    |    |            |    |            |      |      |    |       |        |      |
| 80                | 25, 50, 75, 100<br>125, 150, 175, 200<br>250, 300, 350, 400 | 96.5 | 56.5 | 22 | 16 | 24 | 91.5  | 19   | 16.5 | 14.5 | 202 | M12 | 45.5 | 38 | 7.5  | 15 | 46 | 54 | M12 x 1.75 | 25 | M12 x 1.75 | 10.6 | 17.5 | 3  | Rc3/8 | NPT3/8 | G3/8 |
| 100               |                                                             | 116  | 66   | 26 | 19 | 31 | 111.5 | 22.5 | 20.5 | 18   | 240 | M14 | 55.5 | 45 | 10.5 | 10 | 56 | 62 | M14 x 2.0  | 31 | M14 x 2.0  | 12.5 | 20   | 8  | Rc3/8 | NPT3/8 | G3/8 |

| Bore size<br>[mm] | PA   | PB   | PW | Q  | R   | S  | T   | U   | VA  | VB  | WA               |                              |                               |                               | WB             |                  |                              |                               | X   | YY  | YL  | Z          |                               |                |
|-------------------|------|------|----|----|-----|----|-----|-----|-----|-----|------------------|------------------------------|-------------------------------|-------------------------------|----------------|------------------|------------------------------|-------------------------------|-----|-----|-----|------------|-------------------------------|----------------|
|                   |      |      |    |    |     |    |     |     |     |     | 25 st<br>or less | Over 25 st<br>100 st or less | Over 100 st<br>200 st or less | Over 200 st<br>300 st or less | Over 300<br>st | 25 st<br>or less | Over 25 st<br>100 st or less | Over 100 st<br>200 st or less |     |     |     |            | Over 200 st<br>300 st or less | Over 300<br>st |
|                   |      |      |    |    |     |    |     |     |     |     |                  |                              |                               |                               |                |                  |                              |                               |     |     |     |            |                               |                |
| 80                | 14.5 | 25.5 | 74 | 52 | 174 | 75 | 198 | 156 | 180 | 140 | 28               | 52                           | 128                           | 200                           | 300            | 42               | 54                           | 92                            | 128 | 178 | 100 | M12 x 1.75 | 24                            | 28             |
| 100               | 17.5 | 32.5 | 89 | 64 | 210 | 90 | 236 | 188 | 210 | 166 | 48               | 72                           | 148                           | 220                           | 320            | 35               | 47                           | 85                            | 121 | 171 | 124 | M14 x 2.0  | 28                            | 11             |

## MGPM (Slide bearing) A, DB, E Dimensions

| Bore size [mm] | A             |                           |             | DB | E             |                           |             |
|----------------|---------------|---------------------------|-------------|----|---------------|---------------------------|-------------|
|                | 50 st or less | Over 50 st 200 st or less | Over 200 st |    | 50 st or less | Over 50 st 200 st or less | Over 200 st |
| 80             | 104.5         | 131.5                     | 180.5       | 30 | 8             | 35                        | 84          |
| 100            | 126.5         | 151.5                     | 190.5       | 36 | 10.5          | 35.5                      | 74.5        |

## MGPL (Ball bushing)

## MGPA (High precision ball bushing) A, DB, E Dimensions

| Bore size<br>[mm] | A                |                             |                              |             | DB | E                |                             |                              |             |
|-------------------|------------------|-----------------------------|------------------------------|-------------|----|------------------|-----------------------------|------------------------------|-------------|
|                   | 25 st<br>or less | Over 25 st<br>50 st or less | Over 50 st<br>200 st or less | Over 200 st |    | 25 st<br>or less | Over 25 st<br>50 st or less | Over 50 st<br>200 st or less | Over 200 st |
| 80                | 104.5            | 128.5                       | 158.5                        | 191.5       | 25 | 8                | 32                          | 62                           | 95          |
| 100               | 119.5            | 145.5                       | 178.5                        | 201.5       | 30 | 3.5              | 29.5                        | 62.5                         | 85.5        |