

# Oil Free Bushing Housing Units - Standard Flanged - Standard Type - Built-In Copper Alloy Bushings - Single / Double / Long

# Oil Free Bushing Housing Units - Standard Flanged - Compact Type - Built-In Copper Alloy Bushings - Single / Double

■Feature: Best suitable for vertical use. Reduces the time of manufacturing and assembling the housing.

## Standard Type



(With Non-Contact Seals)



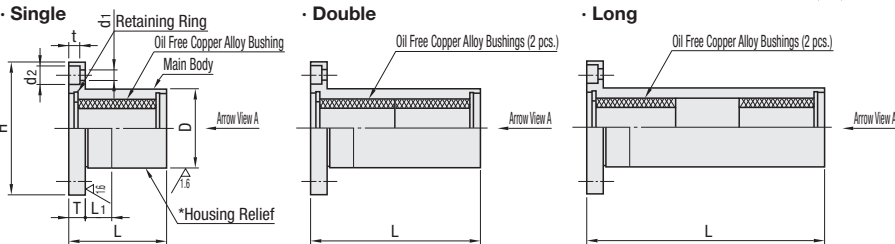
(With Dust Seals)



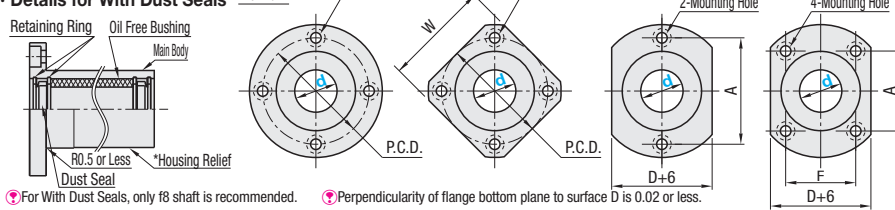
| Housing Type | Type         |               |                | Seal                   | Seals          |                   | Housing | Bushing                    |
|--------------|--------------|---------------|----------------|------------------------|----------------|-------------------|---------|----------------------------|
|              | Round Flange | Square Flange | Compact Flange |                        | Material       | Surface Treatment |         |                            |
| Single       | MFMS         | MFKS          | MFNS           | No Seal                | -              | -                 | SS400   | Electroless Nickel Plating |
|              | MFMS-S       | MFKS-S        | MFNS-S         | With Non-Contact Seals | Teflon Resin   | -                 |         |                            |
|              | MFMS-DS      | -             | MFNS-DS        | With Dust Seals        | Nitrile Rubber | -                 |         |                            |
| Double       | MFMW         | MFKW          | MFNW           | No Seal                | -              | -                 | SS400   | Electroless Nickel Plating |
|              | MFMW-S       | MFKW-S        | MFNW-S         | With Non-Contact Seals | Teflon Resin   | -                 |         |                            |
|              | MFMW-DS      | -             | MFNW-DS        | With Dust Seals        | Nitrile Rubber | -                 |         |                            |
| Long         | MFML         | MFKL          | -              | No Seal                | -              | -                 | SS400   | Electroless Nickel Plating |
|              | MFML-S       | MFKL-S        | -              | With Non-Contact Seals | Teflon Resin   | -                 |         |                            |

\*Housing Relief  
When D≤28, -0.1  
When D≥32, -0.3

Recommended Mating Shaft: f8 or g6



### Details for With Dust Seals



For With Dust Seals, only f8 shaft is recommended.

Perpendicularity of flange bottom plane to surface D is 0.02 or less.

| Part Number |           |                          |               | D              |         | L                                |             |        |                 | L1     | H      | T   | d1  | d2  | t  | P.C.D. | W  | F   | A   |     |    |    |    |    |    |
|-------------|-----------|--------------------------|---------------|----------------|---------|----------------------------------|-------------|--------|-----------------|--------|--------|-----|-----|-----|----|--------|----|-----|-----|-----|----|----|----|----|----|
| Type        |           | d                        | Tolerance     |                |         | No Seal / With Non-Contact Seals |             |        | With Dust Seals |        |        |     |     |     |    |        |    |     |     |     |    |    |    |    |    |
|             |           |                          |               |                |         | Tolerance                        | Single      | Double | Long            | Single | Double |     |     |     |    |        |    |     |     |     |    |    |    |    |    |
| Single      | (No Seal) | Round Flange             | Square Flange | Compact Flange | 6       | +0.022<br>0                      | 12          | 0      | -0.018          | 22     | 37     | 52  | -   | -   | 5  | 28     | 5  | 3.5 | 6   | 3.1 | 20 | 22 | -  | 20 |    |
|             |           | MFMS                     | MFKS          | MFNS           | 8       | +0.028<br>0                      | 15          | 0      | -0.018          | 27     | 47     | 67  | -   | -   |    | 32     |    |     |     |     | 24 | 25 | -  | 24 |    |
|             |           | (With Non-Contact Seals) | MFMS-S        | MFKS-S         | MFNS-S  | 10                               | 0           | 19     | 0               | -0.021 | -      | -   | -   | -   |    | 40     |    |     |     |     | 29 | 30 | -  | 29 |    |
|             |           | (With Dust Seals)        | MFMS-DS       | MFKS-DS        | MFNS-DS | 12                               | +0.034<br>0 | 21     | 0               | -0.021 | 32     | 57  | 82  | -   |    | -      |    |     |     |     | 42 | 32 | 32 | -  | 32 |
| Double      | (No Seal) | Round Flange             | Square Flange | Compact Flange | 13      | +0.034<br>0                      | 23          | 0      | -0.021          | -      | -      | -   | -   | -   | 10 | 43     | 6  | 4.5 | 7.5 | 4.1 | 33 | 34 | -  | 33 |    |
|             |           | MFMW                     | MFKW          | MFNW           | 16*     | +0.041<br>0                      | 28          | 0      | -0.025          | 37     | 67     | 97  | 45  | 75  |    | 48     |    |     |     |     | 38 | 37 | 22 | 31 |    |
|             |           | (With Non-Contact Seals) | MFMW-S        | MFKW-S         | MFNW-S  | 20*                              | +0.041<br>0 | 32     | 0               | -0.025 | 42     | 77  | 112 | 51  |    | 86     |    |     |     |     | 54 | 43 | 42 | 24 | 36 |
|             |           | (With Dust Seals)        | MFMW-DS       | MFKW-DS        | MFNW-DS | 25*                              | +0.041<br>0 | 40     | 0               | -0.025 | 58     | 108 | 158 | 70  |    | 120    |    |     |     |     | 62 | 51 | 50 | 32 | 40 |
| Long        | (No Seal) | Round Flange             | Square Flange | Compact Flange | 30*     | +0.050<br>0                      | 45          | 0      | -0.030          | 68     | 128    | 188 | 81  | 141 | 15 | 74     | 10 | 6.6 | 11  | 6.1 | 60 | 58 | 35 | 49 |    |
|             |           | MFML                     | MFKL          | MFKL-S         | 35      | +0.050<br>0                      | 52          | 0      | -0.030          | 68     | 128    | -   | -   | -   |    | 82     |    |     |     |     | 67 | 64 | -  | -  |    |
|             |           | (With Non-Contact Seals) | MFML-S        | MFKL-S         | 40      | +0.050<br>0                      | 60          | 0      | -0.030          | 80     | 150    | -   | -   | -   |    | 96     |    |     |     |     | 78 | 75 | -  | -  |    |
|             |           |                          |               |                | 50      | +0.050<br>0                      | 80          | 0      | -0.030          | 90     | 170    | -   | -   | -   |    | 116    |    |     |     |     | 98 | 92 | -  | -  |    |

Flanged Height-Adjusting Spacers are selectable from P.286. With Dust Seals are only available in \*marked sizes.

### Features of With Dust Seals / With Non-Contact Seals

- Contact Seals built into With Dust Seals Type prevent small dust from sliding contact surface.
- For sliding resistance of With Dust Seals, refer to Sliding Resistance Test Data.
- Employed Dust Seals are SER series of SAKAGAMI SEISAKUSHO LTD.
- With Non-Contact Seals are provided to prevent large dust entry. Clearance between shafts and bushings (approx. 0.1mm) lower the sliding resistance than With Dust Seals.

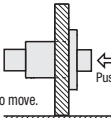
### Dust Seals Sliding Resistance Test

| d  | Sliding Resistance (N) | SAKAGAMI SEISAKUSHO LTD. Dust Seal |
|----|------------------------|------------------------------------|
| 16 | 6                      | SER16                              |
| 20 | 7                      | SER20                              |
| 25 | 8                      | SER25                              |
| 30 | 12                     | SER30                              |

\*Values are for reference only.

### Test Conditions

- Tester: Push-Pull Gauge
  - Bushing: Copper Alloy Type
  - Shaft: MISUMI f8 shaft
- Testing Method  
Measured the load when the shaft started to move.  
\*Velocity 1mm/s approx.



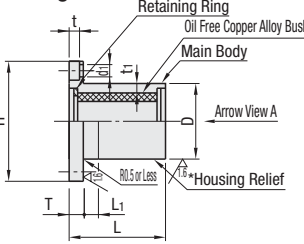
■Feature: Thinning the outer cylinder and cutting out mounting holes from the flange have made the flange diameter compact compared to Oil Free Bushing Housing Units - Standard Flanged - Standard Type -.

## Compact Type

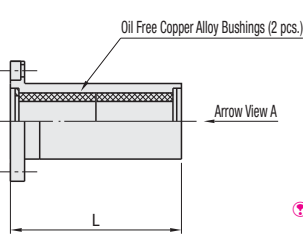


| Housing Type | Type         |               |                | Seal                   | Housing  |                            | Bushing                                           |
|--------------|--------------|---------------|----------------|------------------------|----------|----------------------------|---------------------------------------------------|
|              | Round Flange | Square Flange | Compact Flange |                        | Material | Surface Treatment          |                                                   |
| Single       | MFMSC        | MFKSC         | MFNSC          | No Seal                | SS400    | Electroless Nickel Plating | High Tensile Brass Alloy Solid Lubricant Embedded |
|              | MFMSC-S      | MFKSC-S       | MFNSC-S        | With Non-Contact Seals |          |                            |                                                   |
|              | MFMSC-DS     | -             | MFNSC-DS       | With Dust Seals        |          |                            |                                                   |
| Double       | MFMMC        | MFKMC         | MFNMC          | No Seal                | SS400    | Electroless Nickel Plating | High Tensile Brass Alloy Solid Lubricant Embedded |
|              | MFMMC-S      | MFKMC-S       | MFNMC-S        | With Non-Contact Seals |          |                            |                                                   |
|              | MFMMC-DS     | -             | MFNMC-DS       | With Dust Seals        |          |                            |                                                   |

### Single

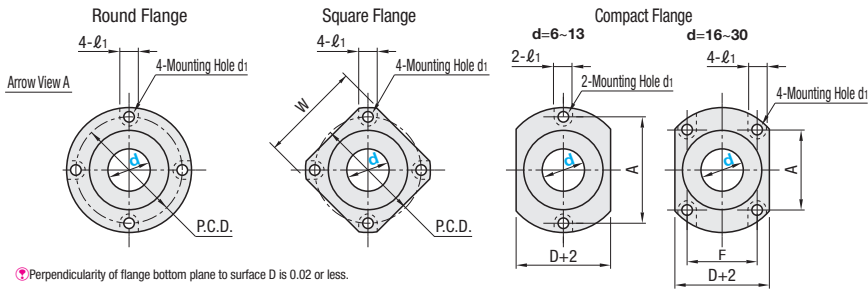


### Double



\*Housing Relief  
When D≤30, -0.1  
When D≥36, -0.3

Recommended Mating Shaft: f8 or g6



With Non-Contact Seals  
Teflon seal of 0.3mm thick is attached on the inner side of each retaining ring.

Perpendicularity of flange bottom plane to surface D is 0.02 or less.

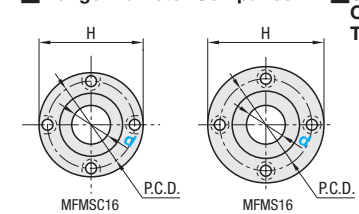
| Part Number |                                       |              |               |                | d  | Tolerance   | D  | Tolerance   | L      |     | L <sub>1</sub> | H  | T  | d <sub>1</sub> | ℓ <sub>1</sub> | t   | t <sub>1</sub> | P.C.D. | W  | F  | A  |
|-------------|---------------------------------------|--------------|---------------|----------------|----|-------------|----|-------------|--------|-----|----------------|----|----|----------------|----------------|-----|----------------|--------|----|----|----|
| Type        |                                       |              |               | Single         |    |             |    |             | Double |     |                |    |    |                |                |     |                |        |    |    |    |
| Single      | (No Seal)<br>(With Non-Contact Seals) | Round Flange | Square Flange | Compact Flange | 6  | +0.022<br>0 | 12 | 0<br>-0.018 | 22     | 37  | 5              | 25 | 5  | 3.5            | 6              | 3.1 | 1.5            | 20     | 20 | -  | 20 |
|             |                                       | MFMS         | MFKS          | MFNS           | 8  | +0.028<br>0 | 15 | 0<br>-0.018 | 27     | 47  |                | 28 | 6  | 4.5            | 7.5            | 4.1 | 2.0            | 23     | 22 | -  | 23 |
|             |                                       | MFMS-S       | MFKS-S        | MFNS-S         | 10 | +0.034<br>0 | 18 | 0<br>-0.021 | 32     | 57  |                | 35 | 8  | 5.5            | 9              | 5.1 | 2.0            | 28     | 27 | -  | 28 |
|             |                                       | MFMS-S       | MFKS-S        | MFNS-S         | 12 | +0.034<br>0 | 20 | 0<br>-0.021 | 37     | 67  |                | 37 | 10 | 6.6            | 11             | 6.1 | 2.0            | 30     | 29 | -  | 30 |
| Double      | (No Seal)<br>(With Non-Contact Seals) | Round Flange | Square Flange | Compact Flange | 13 | +0.034<br>0 | 21 | 0<br>-0.021 | 42     | 77  | 10             | 38 | 6  | 4.5            | 7.5            | 4.1 | 2.0            | 31     | 29 | -  | 31 |
|             |                                       | MFMD         | MFKW          | MFND           | 16 | +0.041<br>0 | 26 | 0<br>-0.021 | 47     | 87  |                | 43 | 8  | 5.5            | 9              | 5.1 | 2.0            | 36     | 33 | 19 | 30 |
|             |                                       | MFMD-S       | MFKW-S        | MFND-S         | 20 | +0.041<br>0 | 30 | 0<br>-0.025 | 52     | 107 |                | 50 | 10 | 6.6            | 11             | 6.1 | 2.0            | 41     | 38 | 21 | 36 |
|             |                                       | MFMD-S       | MFKW-S        | MFND-S         | 25 | +0.041<br>0 | 36 | 0<br>-0.025 | 58     | 108 |                | 56 | 12 | 7.7            | 12             | 6.1 | 2.5            | 47     | 42 | 27 | 38 |
|             |                                       |              |               |                |    |             |    |             |        |     |                | 65 | 10 | 6.6            | 11             | 6.1 | 3.0            | 55     | 49 | 30 | 46 |

For Features of With Non-Contact Seals, refer to P.349.

### Comparison of Flange Diameter (H Dimension) and P.C.D. of MFMS and MFMSC

| d  | H    |       |               | P.C.D. |       |               |
|----|------|-------|---------------|--------|-------|---------------|
|    | MFMS | MFMSC | Reduced Value | MFMS   | MFMSC | Reduced Value |
| 6  | 28   | 25    | -3            | 20     | 20    | 0             |
| 8  | 32   | 28    | -4            | 24     | 23    | -1            |
| 10 | 40   | 35    | -5            | 29     | 28    | -1            |
| 12 | 42   | 37    | -5            | 32     | 30    | -2            |
| 13 | 43   | 38    | -5            | 33     | 31    | -2            |
| 16 | 48   | 43    | -5            | 38     | 36    | -2            |
| 20 | 54   | 50    | -4            | 43     | 41    | -2            |
| 25 | 62   | 56    | -6            | 51     | 47    | -4            |
| 30 | 74   | 65    | -9            | 60     | 55    | -5            |

### Flange Diameter Comparison



### Strength Test Results of Compact and Standard Types P.352