

# Bushings for Locating Pins

## Retaining, Oval

**Retaining**

| Material         | Surface Treatment          | Hardness | Type    |        |
|------------------|----------------------------|----------|---------|--------|
|                  |                            |          | p6      | m6     |
| EN 1.2510 Equiv. | -                          | 56-60HRC | JBAFPG  | JBAFG  |
| EN 1.2510 Equiv. | Black Oxide                | 56-60HRC | JBAFBPG | JBAFBG |
| EN 1.2510 Equiv. | Electroless Nickel Plating | 56-60HRC | JBAFMPG | JBAFMG |
| EN 1.4301 Equiv. | -                          | -        | JBAFSPG | JBAFSG |
| EN 1.4125 Equiv. | -                          | 50-55HRC | JBAFCPG | JBAFCG |

For hole machining, please note that inner diameter shrinkage of p6 Type is more than that of m6 Type. (See "Variance of I.D. after Press-fitting Bushings for Locating Pins" on P.1566)

| Type   | Part Number | D Tol. |        | P                |                 | L      |         | R | Unit Price |         |         |  |  |  |
|--|-------------|--------|--------|------------------|-----------------|--------|---------|---|------------|---------|---------|--|--|--|
|  |             | p6     | m6     | 0.01mm Increment | 0.1mm Increment | JBAFPG | JBAFBPG |   | JBAFMPG    | JBAFSPG | JBAFCPG |  |  |  |
| (p6)<br>JBAFPG<br>JBAFBPG<br>JBAFMPG<br>JBAFSPG<br>JBAFCPG | 8           | +0.024 | +0.015 | 4.00-4.50        | 10.0-13.0       | 1.0    |         |   |            |         |         |  |  |  |
|  | 10          | +0.015 | +0.006 | 4.00-6.50        | 10.0-20.0       |        |         |   |            |         |         |  |  |  |
|  | 12          |        |        | 6.00-8.50        |                 |        |         |   |            |         |         |  |  |  |
|  | 15          | +0.029 | +0.018 | 8.00-10.50       |                 |        |         |   |            |         |         |  |  |  |
|  | 18          | +0.018 | +0.007 | 10.00-12.50      |                 |        |         |   |            |         |         |  |  |  |
|  | 20          |        |        | 12.00-13.50      |                 |        |         |   |            |         |         |  |  |  |
| (m6)<br>JBAFG<br>JBAFBG<br>JBAFMG<br>JBAFSG<br>JBAFCG      | 22          | +0.035 | +0.021 | 12.00-13.50      | 10.0-40.0       | 2.0    |         |   |            |         |         |  |  |  |
|  | 25          | +0.022 | +0.008 | 13.00-15.50      |                 |        |         |   |            |         |         |  |  |  |
|  | 26          |        |        | 15.00-16.50      |                 |        |         |   |            |         |         |  |  |  |
|  | 30          |        |        | 16.00-20.50      |                 |        |         |   |            |         |         |  |  |  |
|  | 35          | +0.042 | +0.025 | 20.00-25.00      | 12.0-60.0       |        | 3.0     |   |            |         |         |  |  |  |
|  |             | +0.026 | +0.009 |                  |                 |        |         |   |            |         |         |  |  |  |

LS-Px3.0

**Shouldered, Retaining**

| Material         | Surface Treatment          | Hardness | Type    |        |       |
|------------------|----------------------------|----------|---------|--------|-------|
|                  |                            |          | p6      | m6     | h6    |
| EN 1.2510 Equiv. | -                          | 56-60HRC | JBHFPG  | JBHFG  | JBHG  |
| EN 1.2510 Equiv. | Electroless Nickel Plating | 56-60HRC | JBHFMPG | JBHFMG | JBHMG |
| EN 1.4125 Equiv. | -                          | 50-55HRC | JBHFCPG | JBHFCG | -     |

The insertion guide is not available for D dimension tolerance h6 at D shaft tip.

| D  | p6     | m6     | h6     |
|----|--------|--------|--------|
| 8  | +0.024 | +0.015 | -0.009 |
| 10 | +0.015 | +0.006 | 0      |
| 12 |        |        |        |
| 15 | +0.029 | +0.018 | -0.011 |
| 18 | +0.018 | +0.007 | 0      |
| 20 |        |        |        |
| 22 |        |        |        |
| 25 | +0.035 | +0.021 | -0.013 |
| 26 | +0.022 | +0.008 | 0      |
| 30 |        |        |        |
| 35 | +0.042 | +0.025 | -0.016 |
|    | +0.026 | +0.009 | 0      |

For hole machining, please note that inner diameter shrinkage of p6 Type is more than that of m6 Type. (See "Variance of I.D. after Press-fitting Bushings for Locating Pins" on P.1566)

| Type  | Part Number | D           | P                |                 | L      |        | Thickness (N) | R | H | T | Unit Price |  |  |
|---|-------------|-------------|------------------|-----------------|--------|--------|---------------|---|---|---|------------|--|--|
|   |             |             | 0.01mm Increment | 0.1mm Increment | JBHFPG | JBHFMG |               |   |   |   | JBHFCPG    |  |  |
| (p6)<br>JBHFPG<br>JBHFMPG<br>JBHFMPG<br>JBHFMPG | 8           | 4.00-4.50   | 8.0-10.0         | 1.75-2.50       | 1.0    | 12     | 3             |   |   |   |            |  |  |
|   | 10          | 4.00-6.50   | 8.0-15.0         | 1.75-3.00       |        | 14     |               |   |   |   |            |  |  |
|   | 12          | 6.00-8.50   |                  |                 |        | 16     |               |   |   |   |            |  |  |
|   | 15          | 8.00-10.50  |                  |                 |        | 19     | 4             |   |   |   |            |  |  |
|   | 18          | 10.00-12.50 |                  |                 |        | 22     |               |   |   |   |            |  |  |
|   | 20          | 12.00-13.50 | 10.0-35.0        |                 |        | 26     | 5             |   |   |   |            |  |  |
| 22  | 12.00-13.50 |             |                  | 30              |        |        |               |   |   |   |            |  |  |
| (h6)<br>JBHG<br>JBHMG                           | 26          | 15.00-16.50 |                  |                 | 3.0    | 35     | 6             |   |   |   |            |  |  |
|   | 30          | 16.00-20.50 | 12.0-50.0        | 4.75-7.00       |        | 40     |               |   |   |   |            |  |  |
|   | 35          | 20.00-25.00 | 5.00-7.50        |                 |        |        |               |   |   |   |            |  |  |

L+T-Px3.0

**Notched, Retaining**

**JBHFG**

Attachment Screw Position

Included Screw

| D1 | L1 | A  | E   | MxP (Coarse) | F  | ℓ   | B | h1  | C   |
|----|----|----|-----|--------------|----|-----|---|-----|-----|
| 6  | 3  | 10 | 4   | 4x0.7        | 8  | 1.2 | 3 | 3   | 0.5 |
| 8  | 4  | 12 | 4.5 | 5x0.8        | 10 | 1.4 | 4 | 3.5 | 0.5 |

Material: EN 1.2510 Equiv.  
Hardness: 56-60HRC  
Accessory: Special Hex Socket Head Cap Screw 1 pc.

| Type  | Part Number | D      | D Tolerance | P                |                 | L                |                 | Thickness (N) | R | H | T | h | a | r | Screw Position Y | Accessory Special Material Screw | Tightening Torque N-cm | Unit Price |  |  |  |  |
|-------|-------------|--------|-------------|------------------|-----------------|------------------|-----------------|---------------|---|---|---|---|---|---|------------------|----------------------------------|------------------------|------------|--|--|--|--|
|       |             |        |             | 0.01mm Increment | 0.1mm Increment | 0.01mm Increment | 0.1mm Increment |               |   |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
| JBHFG | 10          | -0.019 |             | 4.00-6.50        | 3.0-12.0        | 1.75-3.00        | 1               | 18            |   |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
|       | 12          |        |             | 6.00-8.50        | 10.0-18.0       |                  | 20              | 7.5           | 3 |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
|       | 15          | -0.023 |             | 8.00-10.50       |                 | 2.25-3.50        | 23              |               |   |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
|       | 18          |        |             | 10.00-12.50      | 10.0-30.0       | 2.75-4.00        | 26              |               |   |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
|       | 20          |        |             | 12.00-13.50      |                 | 3.25-4.00        | 28              | 2             | 3 |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
|       | 22          |        |             | 12.00-13.50      |                 | 4.25-5.00        | 30              |               |   |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
|       | 25          | -0.027 |             | 13.00-15.50      | 12.0-35.0       | 4.75-6.00        | 33              | 9             | 4 |   |   |   |   |   | 7                | M5                               | 461                    |            |  |  |  |  |
|       | 26          |        |             | 15.00-16.50      |                 | 4.75-5.50        | 34              |               |   |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
|       | 25          |        |             | 16.00-20.50      |                 | 4.75-7.00        | 35              |               |   |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |
|       | 30          |        |             |                  | 12.0-50.0       |                  | 38              |               |   |   |   |   |   |   |                  |                                  |                        |            |  |  |  |  |

L+T-Px3.0

Features: Economy type is priced up to 74% lower than Standard Type with the tolerance of  $+0.3$  for P Dimension/W Dimension and  $-0.2$  for D Dimension.

**Oval - Compact Flange**

| Material         | Surface Treatment          | Hardness | Type  |
|------------------|----------------------------|----------|-------|
| EN 1.2510        | -                          | 56-60HRC | JBEH  |
| EN 1.2510 Equiv. | Electroless Nickel Plating | 56-60HRC | JBEMH |

**Compact Flange**

**Compact Flange Economy**

| Material         | Surface Treatment          | Hardness | Type |
|------------------|----------------------------|----------|------|
| EN 1.1191        | -                          | -        | JBFR |
| EN 1.1191 Equiv. | Electroless Nickel Plating | 45-50HRC | JBFM |
|                  |                            |          | JBFK |
|                  |                            |          | JBFN |

**Compact Flange Economy**

2-d Through  
d: Counterbore Depth h

\*When thickness is 2mm or less and (D-P)/2 ≤ 2, R is 0.5.

**Compact Flange**

| Type          | Part Number | D      | D Tolerance | P           | W            | L               | T | H  | A  | B  | d   | d1  | h   | Unit Price |       |
|---------------|-------------|--------|-------------|-------------|--------------|-----------------|---|----|----|----|-----|-----|-----|------------|-------|
|               |             |        |             |             |              |                 |   |    |    |    |     |     |     | JBEH       | JBEMH |
| JBEH<br>JBEMH | 10          | -0.005 | -0.014      | 4.00-8.00   | 3.00 ≤ W < P | 8-40<br>L+T-Px3 | 5 | 25 | 17 | 12 | 3.3 | 6.5 | 3.5 |            |       |
|               | 12          | -0.006 | -0.017      | 4.00-10.00  |              |                 |   | 28 | 20 | 15 |     |     |     |            |       |
|               | 16          | -0.017 | 8.00-14.00  | 36          |              |                 |   | 26 | 22 |    |     |     |     |            |       |
|               | 20          | -0.007 | -0.020      | 10.00-18.00 |              |                 |   | 40 | 30 | 25 | 4.5 | 8   | 4.5 |            |       |
|               | 25          | -0.020 | 13.00-22.00 | 44          |              |                 |   | 34 | 30 |    |     |     |     |            |       |
|               | 30          | -0.009 | -0.025      | 16.00-25.00 |              |                 |   | 56 | 42 | 35 | 6.6 | 11  | 6.5 |            |       |
| 35            |             |        | 18.0-25.00  | 60          | 46           | 40              |   |    |    |    |     |     |     |            |       |

**Compact Flange Economy**

| Type                         | Part Number | D         | P           | W               | L | T | H  | A  | B  | d | Unit Price |        |      |        |   |  |  |
|------------------------------|-------------|-----------|-------------|-----------------|---|---|----|----|----|---|------------|--------|------|--------|---|--|--|
|                              |             |           |             |                 |   |   |    |    |    |   | JBFR       | JBFM   | JBFK | JBFN   |   |  |  |
| JBFR<br>JBFM<br>JBFK<br>JBFN | 10          | 4.0-8.0   | 4.0 ≤ W < P | 5-40<br>L+T-Px3 | 3 | 5 | 25 | 17 | 12 | 5 | ≤20        | 21 ≤ L | ≤20  | 21 ≤ L |   |  |  |
|                              | 12          | 4.0-10.0  |             |                 |   |   |    |    |    |   | 28         | 20     | 15   |        |   |  |  |
|                              | 15          | 8.0-13.0  |             |                 |   |   |    |    |    |   | 17         |        |      |        |   |  |  |
|                              | 16          | 8.0-14.0  |             |                 |   |   |    |    |    |   |            |        |      |        |   |  |  |
|                              | 18          | 10.0-16.0 |             |                 |   |   |    |    |    |   | 40         | 30     | 20   | 6      |   |  |  |
|                              | 20          | 10.0-18.0 |             |                 |   |   |    |    |    |   | 22         |        |      |        |   |  |  |
|                              | 25          | 13.0-22.0 |             |                 |   |   |    |    |    |   | 4          | 44     | 34   | 30     |   |  |  |
|                              | 30          | 16.0-25.0 |             |                 |   |   |    |    |    |   | 5          | 56     | 42   | 35     | 8 |  |  |
|                              | 35          | 18.0-25.0 |             |                 |   |   |    |    |    |   | 60         | 46     | 40   |        |   |  |  |

**Oval - Shouldered (Dowel Pin)**

| Material         | Surface Treatment          | Hardness | Type  |
|------------------|----------------------------|----------|-------|
| EN 1.2510        | -                          | 56-60HRC | JBPE  |
| EN 1.2510 Equiv. | Electroless Nickel Plating | 56-60HRC | JBPEM |

\*When thickness is 2mm or less and (D-P)/2 ≤ 2, R is 0.5.

| Type                  | Part Number | D      | D Tolerance |             | P            | W               | L | T  | H  | Unit Price |             |
|-----------------------|-------------|--------|-------------|-------------|--------------|-----------------|---|----|----|------------|-------------|
|                       |             |        | p6          | m6          |              |                 |   |    |    | JBPE       | JBPEM, JBEM |
| (p6)<br>JBPE<br>JBPEM | 10          | +0.024 | +0.015      | 4.00-8.00   | 3.00 ≤ W < P | 8-40<br>L+T-Px3 | 3 | 14 | 16 | 20         | 26          |
|                       | 12          | +0.015 | +0.006      | 4.00-10.00  |              |                 |   |    |    |            |             |
|                       | 16          | +0.029 | +0.018      | 8.00-14.00  |              |                 |   |    |    |            |             |
|                       | 20          | +0.035 | +0.021      | 10.00-18.00 |              |                 |   |    |    |            |             |
|                       | 25          | +0.022 | +0.008      | 13.00-22.00 |              |                 |   |    |    |            |             |
|                       | 30          | +0.035 | +0.008      | 16.00-25.00 |              |                 |   |    |    |            |             |
| (m6)<br>JBE<br>JBEM   | 35          | +0.042 | +0.025      | 18.0-25.00  | 5            | 40              |   |    |    |            |             |
|                       |             | +0.026 | +0.009      |             |              |                 |   |    |    |            |             |

Ordering Example

Part Number - P - W - L

JBAFG8 - P4.1 - W - L11  
 JBHG20 - P13.0 - W - L20  
 JBHFYG18 - P12.00 - W - L18.0  
 JBF10 - P6.0 - W4.5 - L10  
 JBPE10 - P6.8 - W4.8 - L15

Alterations

Part Number - P - W - L - (HC, RH)

JBAFPG18 - P8.00 - W4.5 - L15.0 - HC  
 JBF10 - P6.0 - W4.5 - L10 - RH

Example Notched, Retaining

| Alterations             | Code | Spec.   |
|-------------------------|------|---|
| Set Screw Groove Depth  | HC   | Changes the depth of set screw groove depth from 0.5mm to 1.0mm.<br>Ordering Code HC<br>Applicable to Retaining Straight only.<br>Applicable to D dimension 18 or more.   |
| Inner Diameter Radius R | RH   | Changes the inner diameter radius R from shoulder side to D dimension end face.<br>Size of R will be the same as R on shoulder side.<br>Ordering Code RH<br>Applicable to Compact Flange, Economy Type only.<br>(D-P)/2 - R ≥ 1.7 |