

# BALL-LOCK PUNCHES & DIES·RETAINERS

## BALL-LOCK PUNCHES & DIES·RETAINERS



| Product name<br>Type | BALL-LOCK PUNCHES<br>—LIGHT LOAD— | —ECONOMY TYPE—<br>HEAVY LOAD | BALL-LOCK JECTOR PUNCHES<br>—LIGHT LOAD— | —ECONOMY TYPE—<br>—HEAVY LOAD— | BALL-LOCK PUNCHES<br>—LIGHT LOAD— | —WITH SPANNER GROOVE—<br>—HEAVY LOAD— |
|----------------------|-----------------------------------|------------------------------|------------------------------------------|--------------------------------|-----------------------------------|---------------------------------------|
| Page                 | 647                               | 648                          | 649                                      | 650                            | 651                               | 652                                   |



| BALL-LOCK JECTOR PUNCHES<br>—LIGHT LOAD— | —WITH WRENCH FLAT—<br>—HEAVY LOAD— | BALL-LOCK PUNCH BLANKS<br>—LIGHT LOAD— | —ECONOMY TYPE—<br>—HEAVY LOAD— | BALL-LOCK PUNCH BLANKS<br>—LIGHT LOAD— | —WITH WRENCH FLAT—<br>—HEAVY LOAD— | BALL-LOCK BUTTON DIES<br>ELD <input type="checkbox"/> LD <input type="checkbox"/> |
|------------------------------------------|------------------------------------|----------------------------------------|--------------------------------|----------------------------------------|------------------------------------|-----------------------------------------------------------------------------------|
| 653                                      | 654                                | 655                                    |                                | 656                                    |                                    | 657                                                                               |



| BALL-LOCK RETAINERS<br>—LIGHT LOAD— | —COMPACT TYPE—<br>—HEAVY LOAD— | BALL-LOCK RETAINERS<br>—LIGHT LOAD— | —TRIANGLE TYPE—<br>—HEAVY LOAD— | BALL-LOCK RETAINERS<br>—LIGHT LOAD TYPE (TRIANGLE COMPACT TYPE)— |
|-------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------------------------------------------------------------------|
| 659                                 | 660                            | 661                                 | 662                             | 663                                                              |



| BALL-LOCK RETAINERS<br>—LIGHT LOAD·LIGHT LOAD·LIGHT LOAD— | SPECIAL RETAINER SETS<br>FOR BALL-LOCK PUNCHES |
|-----------------------------------------------------------|------------------------------------------------|
| 664                                                       | 667                                            |

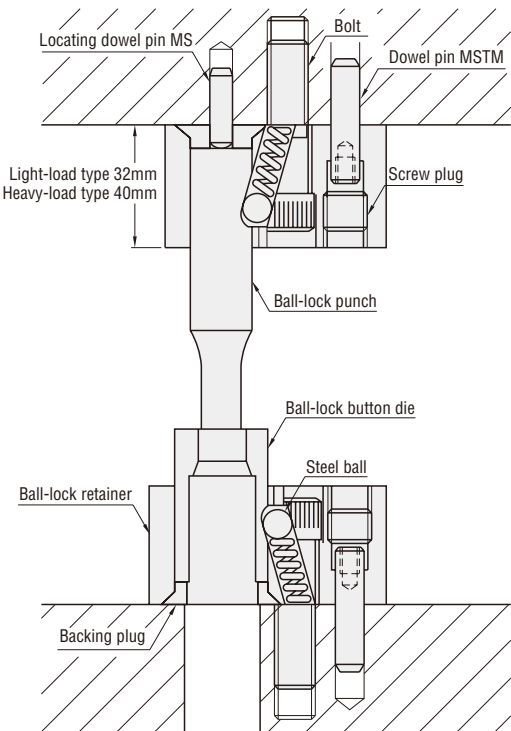
# BALL-LOCK PUNCHES & DIES·RETAINERS

## — GUIDE —

### ■ Structure of ball-lock punches & dies

The punch and die are fixed together by two retainers that each incorporates a steel ball and spring. The spring presses the ball into the recess (ball seat) of the punch or die, securely holding the punch and die in place.

The punch or die can be dismantled simply by pushing the steel ball, without removing the retainer.



### ■ Punches

- Select either the heavy-load type or the light-load type according to the conditions of use.
- Use the heavy-load type if the workpiece thickness is 3mm or more.
- A ejector type for preventing scrap lifting is available for each type (heavy or light).

### ■ Retainers

- Light and heavy-load types are available, to be selected according to the punch type.
- Use a light-load retainer for a light-load punch, and a heavy-load retainer for a heavy-load punch.

|            | Shape                                          | Locating method                                                                                                                               |
|------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Light load | <p>2— <math>\phi 6</math><br/>(Dowel hole)</p> | <b>●Punch positioning by NC machining</b><br>Position the punch using the backing plug center dowel and the retainer dowel hole.              |
| Heavy load | <p>2— <math>\phi 6</math><br/>(Dowel hole)</p> | <b>●Punch positioning by matching of the tip and shaped hole</b><br>Create matching holes corresponding to the 2 dowel holes in the retainer. |

### ■ Precautions

When removing a ball-lock punch and die from the retainers, be sure that the retainer is fastened to the die.

If the ball-lock punch and die is removed without the retainer fastened to the die, the spring may jump out and cause a malfunction.

# BALL-LOCK PUNCHES

## —LIGHT LOAD TYPE (ECONOMY)—

| Shank type                                           |                                                                | Catalog No.                                                                        |                        | The tip shape can be selected from Tip shape A ~ G in the figure below. |  |
|------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------|--|
|                                                      |                                                                | Type                                                                               | Tip shape              | Tip length                                                              |  |
| <br><b>RoHS</b><br>Equivalent to SKD11<br>60 ~ 63HRC |                                                                | <b>ELP</b>                                                                         | <br><br><br><br>       | <br>                                                                    |  |
| <b>Tip shape A</b><br>                               | <b>Tip shape D</b><br>                                         | <b>Tip shape R</b><br>                                                             | <b>Tip shape E</b><br> | <b>Tip shape G</b><br>                                                  |  |
| $\phi 0.01$ A                                        | $P \geq W$<br>$R=0$ can be selected.<br>$K = \sqrt{P^2 + W^2}$ | $P \geq W$<br>$0.15 \leq R < \frac{W}{2}$<br>$K = \sqrt{(P-2R)^2 + (W-2R)^2} + 2R$ | $P > W$                | $P > W$                                                                 |  |

| Catalog No. |                                                                                   | D  | L              | 0.01mm increments |        |         |                                      |    | B |
|-------------|-----------------------------------------------------------------------------------|----|----------------|-------------------|--------|---------|--------------------------------------|----|---|
| Type        |                                                                                   |    |                | (A)               |        | D R E G |                                      | R  |   |
|             |                                                                                   |    |                | min.              | P max. | P-Kmax. | P-Wmin.                              |    |   |
| S           |  | 10 | 63 71 74 80 90 | 3.00 ~ 9.97       | 9.90   | 2.50    | 0.15 ≤ R < $\frac{W}{2}$<br>(B only) | 13 |   |
| A           | ELPAS                                                                             | 13 |                | 6.00 ~ 12.97      | 12.90  | 3.00    |                                      |    |   |
| D           | ELPDS                                                                             | 16 |                | 10.00 ~ 15.97     | 15.90  | 4.00    |                                      |    |   |
| R           | ELPRS                                                                             | 20 |                | 13.00 ~ 19.97     | 19.90  | 5.00    |                                      | 19 |   |
| E           | ELPES                                                                             | 25 |                | 18.00 ~ 24.97     | 24.90  | 6.00    |                                      |    |   |
| G           | ELPGS                                                                             | 32 |                | 22.00 ~ 31.97     | 31.90  | 7.00    |                                      |    |   |
| L           |  | 10 | 71 74 80 90    | 3.00 ~ 9.97       | 9.90   | 2.50    | 0.15 ≤ R < $\frac{W}{2}$<br>(B only) | 19 |   |
| A           | ELPAL                                                                             | 13 |                | 6.00 ~ 12.97      | 12.90  | 3.00    |                                      |    |   |
| D           | ELPD L                                                                            | 16 |                | 10.00 ~ 15.97     | 15.90  | 4.00    |                                      |    |   |
| R           | ELPRL                                                                             | 20 |                | 13.00 ~ 19.97     | 19.90  | 5.00    |                                      | 25 |   |
| E           | ELPEL                                                                             | 25 |                | 18.00 ~ 24.97     | 24.90  | 6.00    |                                      |    |   |
| G           | ELPGL                                                                             | 32 |                | 22.00 ~ 31.97     | 31.90  | 7.00    |                                      |    |   |



Price

**Quotation**



Order

Catalog No. — L — P — W — R (B only)  
ELPRS 16 — 74 — P12.00 — W10.00 — R3.00



Days to Ship

**Quotation**



Alterations

Catalog No. — L (LC) — P (PC) — W (WC) — R — (BC·KC, etc.)  
ELPRS 16 — LC70.5 — P12.00 — W10.00 — R3.00 — BC15.5

| Alteration         | Code                                                                                                                                                                                                                                         | (A)                                                                                                                                                                                                                                                                                                                                                                                                                                               | D R E G | 1Code |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|-------------|----|-------------|----|--------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|-------------|---|-------------|----|-------------|----|-------------|----|--------|----|-----------|
| Alterations to tip | PC<br>WC                                                                                                                                                                                                                                     |  <p>Tip diameter change<br/><math>PC \geq \frac{P_{min}}{2}</math><br/>0.01mm increments<br/>(If combined with PKC, 0.001mm increments can be selected.)</p> <table><thead><tr><th>P</th><th>Bmax.</th></tr></thead><tbody><tr><td>1.50 ~ 1.99</td><td>20</td></tr><tr><td>2.00 ~ 3.99</td><td>35</td></tr><tr><td>4.00 ~</td><td>45</td></tr></tbody></table> | P       | Bmax. | 1.50 ~ 1.99 | 20 | 2.00 ~ 3.99 | 35 | 4.00 ~ | 45 | <p>Tip diameter change<br/><math>PC \geq \frac{P \cdot W_{min}}{2}</math><br/>0.01mm increments</p> <table><thead><tr><th>P-W</th><th>Bmax.</th></tr></thead><tbody><tr><td>1.25 ~ 1.49</td><td>8</td></tr><tr><td>1.50 ~ 1.99</td><td>13</td></tr><tr><td>2.00 ~ 3.49</td><td>19</td></tr><tr><td>3.50 ~ 4.99</td><td>25</td></tr><tr><td>5.00 ~</td><td>30</td></tr></tbody></table> | P-W | Bmax. | 1.25 ~ 1.49 | 8 | 1.50 ~ 1.99 | 13 | 2.00 ~ 3.49 | 19 | 3.50 ~ 4.99 | 25 | 5.00 ~ | 30 | Quotation |
|                    | P                                                                                                                                                                                                                                            | Bmax.                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
|                    | 1.50 ~ 1.99                                                                                                                                                                                                                                  | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 2.00 ~ 3.99        | 35                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 4.00 ~             | 45                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| P-W                | Bmax.                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 1.25 ~ 1.49        | 8                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 1.50 ~ 1.99        | 13                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 2.00 ~ 3.49        | 19                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 3.50 ~ 4.99        | 25                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 5.00 ~             | 30                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| BC                 |  <p>Tip length change<br/><math>2 \leq BC \leq B_{max}</math> 0.1mm increments<br/>Full length (L) must be at least 45mm longer than tip length (BC).</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |
| PKC                |  <p>Tip tolerance change<br/><math>P \pm 0.01 \rightarrow +0.005</math><br/>0</p>                                                                         | <p>Tip tolerance change<br/><math>P \cdot W \pm 0.01 \rightarrow +0.01</math><br/>0</p>                                                                                                                                                                                                                                                                                                                                                           |         |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                                                        |     |       |             |   |             |    |             |    |             |    |        |    |           |

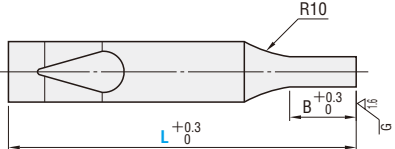
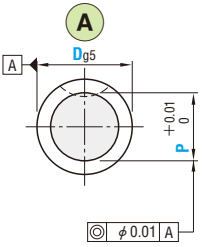
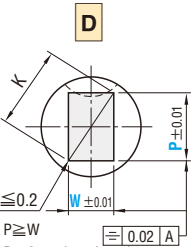
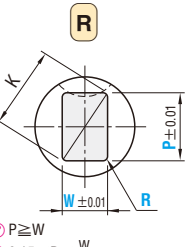
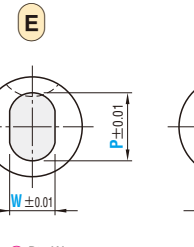
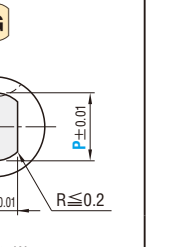
**Quotation**

| Alteration                            | Code | (A)                                                                                                                                                                                                                                                       | D R E G                                                             | 1Code |
|---------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------|
| <br><b>Alterations to tip</b>         | PRC  | Rounding of tip side edge<br>$0.3 \leq PRC \leq 1$<br>0.1 mm increments<br>$PRC \leq (P-0.2)/2$<br>Cannot be combined with PCC.                                                                                                                           |                                                                     |       |
|                                       | PCC  | Chamfering to tip side edge<br>$0.3 \leq PCC \leq 1$<br>0.1 mm increments<br>$PCC \leq (P-0.2)/2$<br>Cannot be combined with PRC.                                                                                                                         |                                                                     |       |
|                                       | LC   | Full length change<br>$45 + B(BC) \leq LC < L$<br>0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)<br>If difference between full length (LC) and tip length (B) is 45mm or less, tip length is adjusted to (Full length - 45). |                                                                     |       |
| <br><b>Alterations to full length</b> | LKC  | Full length tolerance change<br>$L + 0.3 \rightarrow +0.05$<br>0                                                                                                                                                                                          |                                                                     |       |
| <br><b>Others</b>                     | KC   |                                                                                                                                                                                                                                                           | $0^\circ$<br>270° 180°<br>Ball position<br>90° change 1° increments |       |

**Quotation**

# BALL-LOCK PUNCHES

## —HEAVY LOAD TYPE (ECONOMY)—

| Shank type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      | Catalog No.         |           | The tip shape can be selected from tip shape A ~ G in the figure below.                                                                                                |                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      | Type                | Tip shape | B                                                                                                                                                                      | Tip length                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RoHS | SKH51<br>61 ~ 64HRC | EBP       | <br> |  |
| <div> <div> <b>Tip shape A</b><br/> <br/> <math>\phi 0.01</math> A         </div> <div> <b>Tip shape D</b><br/> <br/> <math>R \leq 0.2</math><br/> <math>P \geq W</math><br/> <math>R=0</math> can be selected.<br/> <math>K = \sqrt{P^2 + W^2}</math> </div> <div> <b>Tip shape R</b><br/> <br/> <math>P \geq W</math><br/> <math>0.15 \leq R &lt; \frac{W}{2}</math><br/> <math>K = \sqrt{(P-2R)^2 + (W-2R)^2} + 2R</math> </div> <div> <b>Tip shape E</b><br/> <br/> <math>P &gt; W</math> </div> <div> <b>Tip shape G</b><br/> <br/> <math>P &gt; W</math> </div> </div> |      |                     |           |                                                                                                                                                                        |                                                                                    |

| Catalog No. |       | D  | L            | 0.01mm increments  |              |              |        | B  |
|-------------|-------|----|--------------|--------------------|--------------|--------------|--------|----|
| Type        |       |    |              | (A)<br>min. P max. | D<br>P-Kmax. | R<br>P-Wmin. | E<br>R |    |
| S           |       | 10 | 71 80 90 100 | 3.00 ~ 9.97        | 9.90         | 2.50         |        | 13 |
| A           | EBPAS | 13 |              | 6.00 ~ 12.97       | 12.90        | 3.00         |        |    |
| D           | EBPDS | 16 |              | 10.00 ~ 15.97      | 15.90        | 4.00         |        |    |
| R           | EBPRS | 20 |              | 13.00 ~ 19.97      | 19.90        | 5.00         |        | 19 |
| E           | EBPES | 25 |              | 18.00 ~ 24.97      | 24.90        | 6.00         |        |    |
| G           | EBPGS | 32 |              | 22.00 ~ 31.97      | 31.90        | 7.00         |        |    |
| L           |       | 10 | 80 90 100    | 3.00 ~ 9.97        | 9.90         | 2.50         |        | 19 |
| A           | EBPAL | 13 |              | 6.00 ~ 12.97       | 12.90        | 3.00         |        |    |
| D           | EBPDL | 16 |              | 10.00 ~ 15.97      | 15.90        | 4.00         |        |    |
| R           | EBPRL | 20 |              | 13.00 ~ 19.97      | 19.90        | 5.00         |        | 25 |
| E           | EBPEL | 25 |              | 18.00 ~ 24.97      | 24.90        | 6.00         |        |    |
| G           | EBPGL | 32 |              | 22.00 ~ 31.97      | 31.90        | 7.00         |        |    |



Price

Quotation



Order

Catalog No. — L — P — W — R (R only)  
EBPRL 32 — 100 — P26.20 — W14.00 — R3.00



Days to Ship

Quotation



Alterations

Catalog No. — L (LC) — P (PC) — W (WC) — R — (BC·KC, etc.)  
EBPDS 32 — 100 — P26.20 — W14.00 — KC90

| Alteration         | Code                                                                                                                                                       | (A)                                                                                                                                                                                                                                                                                                                                                                    | D R E G | 1Code |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|-------------|----|-------------|----|-------------|----|--------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------------|---|-------------|----|-------------|----|-------------|----|--------|----|-----------|
| Alterations to tip | PC<br>WC                                                                                                                                                   | <p>Tip diameter change<br/><math>PC \geq \frac{P_{min}}{2}</math><br/>0.01mm increments<br/>(If combined with PKC, 0.001mm increments can be selected.)</p> <table><tr><th>P</th><th>Bmax</th></tr><tr><td>1.50 ~ 1.99</td><td>20</td></tr><tr><td>2.00 ~ 3.99</td><td>35</td></tr><tr><td>4.00 ~ 5.99</td><td>45</td></tr><tr><td>6.00 ~</td><td>50</td></tr></table> | P       | Bmax  | 1.50 ~ 1.99 | 20 | 2.00 ~ 3.99 | 35 | 4.00 ~ 5.99 | 45 | 6.00 ~ | 50 | <p>Tip diameter change<br/><math>PC \geq \frac{P-W_{min}}{2}</math><br/>0.01mm increments</p> <table><tr><th>P-W</th><th>Bmax</th></tr><tr><td>1.25 ~ 1.49</td><td>8</td></tr><tr><td>1.50 ~ 1.99</td><td>13</td></tr><tr><td>2.00 ~ 3.49</td><td>19</td></tr><tr><td>3.50 ~ 4.99</td><td>25</td></tr><tr><td>5.00 ~</td><td>30</td></tr></table> | P-W | Bmax | 1.25 ~ 1.49 | 8 | 1.50 ~ 1.99 | 13 | 2.00 ~ 3.49 | 19 | 3.50 ~ 4.99 | 25 | 5.00 ~ | 30 | Quotation |
|                    | P                                                                                                                                                          | Bmax                                                                                                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
|                    | 1.50 ~ 1.99                                                                                                                                                | 20                                                                                                                                                                                                                                                                                                                                                                     |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| 2.00 ~ 3.99        | 35                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| 4.00 ~ 5.99        | 45                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| 6.00 ~             | 50                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| P-W                | Bmax                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| 1.25 ~ 1.49        | 8                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| 1.50 ~ 1.99        | 13                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| 2.00 ~ 3.49        | 19                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| 3.50 ~ 4.99        | 25                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| 5.00 ~             | 30                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| BC                 | <p>Tip length change<br/><math>2 \leq BC \leq B_{max}</math> 0.1mm increments<br/>⚠ Full length (L) must be at least 50mm longer than tip length (BC).</p> |                                                                                                                                                                                                                                                                                                                                                                        |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |
| PKC                | <p>Tip tolerance change<br/><math>P + 0.01 \rightarrow +0.005</math><br/>0</p>                                                                             | <p>Tip tolerance change<br/><math>P-W \pm 0.01 \rightarrow +0.01</math><br/>0</p>                                                                                                                                                                                                                                                                                      |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                                   |     |      |             |   |             |    |             |    |             |    |        |    |           |

| Alteration                 | Code | (A)                                                                                                                                                                                                                                                       | D R E G | 1Code     |
|----------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|
| Alterations to tip         | PRC  | Rounding of tip side edge<br>$0.3 \leq PRC \leq 1$<br>0.1 mm increments<br>$PRC \leq (P-0.2)/2$<br>Cannot be combined with PCC.                                                                                                                           |         | Quotation |
|                            | PCC  | Chamfering to tip side edge<br>$0.3 \leq PCC \leq 1$<br>0.1mm increments<br>$PCC \leq (P-0.2)/2$<br>Cannot be combined with PRC.                                                                                                                          |         |           |
| Alterations to full length | LC   | Full length change<br>$50 + B(BC) \leq LC < L$<br>0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)<br>If difference between full length (LC) and tip length (B) is 50mm or less, tip length is adjusted to (Full length - 50). |         | Quotation |
|                            | LKC  | Full length tolerance change<br>$L + 0.3 \rightarrow +0.05$<br>$0$                                                                                                                                                                                        |         |           |
| Others                     | KC   | Ball position<br>$0^\circ$<br>$270^\circ$<br>$180^\circ$<br>90° change 1° increments                                                                                                                                                                      |         |           |

# BALL-LOCK JECTOR PUNCHES

— LIGHT LOAD TYPE (ECONOMY) —

| Shank type                                            |                                                                                                                 | Catalog No.                                                                                                      |                                                       | The tip shape can be selected from Tip shape A ~ G in the figure below. |  |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------|--|
|                                                       |                                                                                                                 | Type                                                                                                             | Tip shape<br>Tip length                               |                                                                         |  |
| <br><b>RoHS</b>                                       | Equivalent to SKD11<br>60 ~ 63HRC                                                                               | <b>ELJ</b>                                                                                                       | <br>S<br>L                                            |                                                                         |  |
| <b>Tip shape A</b>                                    | <b>Tip shape D</b>                                                                                              | <b>Tip shape R</b>                                                                                               | <b>Tip shape E</b>                                    | <b>Tip shape G</b>                                                      |  |
| <br>D <sub>g5</sub><br>P <sub>±0.01</sub><br>φ 0.01 A | <br>K<br>R ≤ 0.2<br>W <sub>±0.01</sub><br>P <sub>±0.01</sub><br>P ≥ W<br>R=0 can be selected.<br>K = √(P² + W²) | <br>K<br>R<br>W <sub>±0.01</sub><br>P <sub>±0.01</sub><br>P ≥ W<br>0.15 ≤ R < W/2<br>K = √(P-2R)² + (W-2R)² + 2R | <br>W <sub>±0.01</sub><br>P <sub>±0.01</sub><br>P > W | <br>W <sub>±0.01</sub><br>P <sub>±0.01</sub><br>R ≤ 0.2<br>P > W        |  |

| Catalog No. |       | D  | L              | 0.01mm increments |              |              |              |              | B  | d<br>(hole diameter) |
|-------------|-------|----|----------------|-------------------|--------------|--------------|--------------|--------------|----|----------------------|
| Type        |       |    |                | A<br>min. P max.  | D<br>P-Kmax. | R<br>P-Wmin. | E<br>P-Kmax. | G<br>P-Wmin. |    |                      |
| S           |       | 10 | 63 71 74 80 90 | 3.00 ~ 9.97       | 9.90         | 3.00         |              |              | 13 | 1.5                  |
| A           | ELJAS | 13 |                | 6.00 ~ 12.97      | 12.90        | 6.00         |              |              | 13 | 1.8                  |
| D           | ELJDS | 16 |                | 10.00 ~ 15.97     | 15.90        | 6.00         |              |              |    |                      |
| R           | ELJRS | 20 |                | 13.00 ~ 19.97     | 19.90        | 6.00         |              |              | 19 | 2.8                  |
| E           | ELJES | 25 |                | 18.00 ~ 24.97     | 24.90        | 6.00         |              |              |    |                      |
| G           | ELJGS | 32 |                | 22.00 ~ 31.97     | 31.90        | 6.00         |              |              |    |                      |
| L           |       | 10 | 71 74 80 90    | 3.00 ~ 9.97       | 9.90         | 3.00         |              |              | 19 | 1.5                  |
| A           | ELJAL | 13 |                | 6.00 ~ 12.97      | 12.90        | 6.00         |              |              | 19 | 1.8                  |
| D           | ELJDL | 16 |                | 10.00 ~ 15.97     | 15.90        | 6.00         |              |              |    |                      |
| R           | ELJRL | 20 |                | 13.00 ~ 19.97     | 19.90        | 6.00         |              |              | 25 | 2.8                  |
| E           | ELJEL | 25 |                | 18.00 ~ 24.97     | 24.90        | 6.00         |              |              |    |                      |
| G           | ELJGL | 32 |                | 22.00 ~ 31.97     | 31.90        | 6.00         |              |              |    |                      |



Price

**Quotation**



Order

Catalog No. — L — P — W — R (R only)

ELJEL 25 — 80 — P21.00 — W12.40



Days to Ship

**Quotation**



Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC, etc.)

ELJEL 25 — 80 — P21.00 — W12.40 — PKC

| Alteration                    | Code                   | A                                                                                                                                                                                                     | D R E G                                                                                                                                        | 1Code            |
|-------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <br><b>Alterations to tip</b> | <b>PC</b><br><b>WC</b> | Tip diameter change<br>PC ≥ PCmin.<br>0.01mm increments<br>(If combined with PKC, 0.001mm increments can be selected.)<br>D PCmin.<br>10 2.80<br>13 5.00<br>16 8.00<br>20 9.00<br>25 9.00<br>32 15.00 | Tip diameter change<br>PC·WC ≥ PC·WCmin.<br>0.01mm increments<br>D PC·WCmin.<br>10 2.80<br>13 5.00<br>16 5.00<br>20 5.00<br>25 5.00<br>32 5.00 | <b>Quotation</b> |
|                               | <b>BC</b>              | Tip length change<br>2 ≤ BC < B<br>0.1mm increments                                                                                                                                                   |                                                                                                                                                |                  |
|                               | <b>PKC</b>             | Tip tolerance change<br>P + 0.01 → + 0.005<br>0                                                                                                                                                       | Tip tolerance change<br>P·W ± 0.01 → + 0.01<br>0                                                                                               |                  |
|                               |                        |                                                                                                                                                                                                       |                                                                                                                                                |                  |

| Alteration                            | Code       | A                                                                                                                                                            | D R E G                                                | 1Code            |
|---------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------|
| <br><b>Alterations to tip</b>         | <b>PRC</b> | Rounding of tip side edge<br>0.3 ≤ PRC ≤ 1<br>0.1mm increments<br>PRC ≤ (P-d-0.5)/2<br>Cannot be combined with PCC.                                          |                                                        | <b>Quotation</b> |
|                                       | <b>PCC</b> | Chamfering to tip side edge<br>0.3 ≤ PCC ≤ 1<br>0.1mm increments<br>PCC ≤ (P-d-0.5)/2<br>Cannot be combined with PRC.                                        |                                                        |                  |
|                                       | <b>LC</b>  | Full length change L - (B-2) ≤ LC < L<br>0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)<br>Tip length B is shortened by (L-LC). |                                                        |                  |
| <br><b>Alterations to full length</b> | <b>LKC</b> | Full length tolerance change<br>L + 0.3 → + 0.05<br>0                                                                                                        |                                                        |                  |
| <br><b>Others</b>                     | <b>KC</b>  |                                                                                                                                                              | Ball position change 1° increments<br>270° 0° 90° 180° |                  |

# BALL-LOCK JECTOR PUNCHES

—HEAVY LOAD TYPE (ECONOMY)—

| Shank type                                |                                                                                                    | Catalog No.                                                                                                 |                                        | The tip shape can be selected from Tip shape A ~ G in the figure below. |  |
|-------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------|--|
|                                           |                                                                                                    | Type                                                                                                        | Tip shape                              | B<br>Tip length                                                         |  |
| <br><b>RoHS</b>                           | SKH51<br>61 ~ 64HRC                                                                                | <b>EBJ</b>                                                                                                  | <br>A<br>D<br>R<br>E<br>G              | <br>S<br>L                                                              |  |
| <b>Tip shape A</b>                        | <b>Tip shape D</b>                                                                                 | <b>Tip shape R</b>                                                                                          | <b>Tip shape E</b>                     | <b>Tip shape G</b>                                                      |  |
| <br>A<br>D <sub>g5</sub><br>P<br>φ 0.01 A | <br>D<br>K<br>R ≤ 0.2<br>W ± 0.01<br>P ± 0.01<br>P ≥ W<br>R = 0 can be selected.<br>K = √(P² + W²) | <br>R<br>K<br>R ≤ 0.2<br>W ± 0.01<br>P ± 0.01<br>P ≥ W<br>0.15 ≤ R < W/2<br>K = √(P - 2R)² + (W - 2R)² + 2R | <br>E<br>W ± 0.01<br>P ± 0.01<br>P > W | <br>G<br>W ± 0.01<br>P ± 0.01<br>R ≤ 0.2<br>P > W                       |  |

| Catalog No. |       | D  | L            | 0.01mm increments |              |              |                            | B  | d<br>(Hole diameter) |
|-------------|-------|----|--------------|-------------------|--------------|--------------|----------------------------|----|----------------------|
| Type        |       |    |              | A<br>min. P max.  | D<br>P-Kmax. | R<br>P-Wmin. | R<br>R                     |    |                      |
| S           |       | 10 | 71 80 90 100 | 3.00 ~ 9.97       | 9.90         | 3.00         | 0.15 ≤ R < W/2<br>(B only) | 13 | 1.5                  |
| A           | EBJAS | 13 |              | 6.00 ~ 12.97      | 12.90        | 6.00         |                            |    | 1.8                  |
| D           | EBJDS | 16 |              | 10.00 ~ 15.97     | 15.90        | 6.00         |                            |    |                      |
| R           | EBJRS | 20 |              | 13.00 ~ 19.97     | 19.90        | 6.00         |                            | 19 | 2.8                  |
| E           | EBJES | 25 |              | 18.00 ~ 24.97     | 24.90        | 6.00         |                            |    |                      |
| G           | EBJGS | 32 |              | 22.00 ~ 31.97     | 31.90        | 6.00         |                            |    |                      |
| L           |       | 10 | 80 90 100    | 3.00 ~ 9.97       | 9.90         | 3.00         |                            | 19 | 1.5                  |
| A           | EBJAL | 13 |              | 6.00 ~ 12.97      | 12.90        | 6.00         |                            |    | 1.8                  |
| D           | EBJDL | 16 |              | 10.00 ~ 15.97     | 15.90        | 6.00         |                            |    |                      |
| R           | EBJRL | 20 |              | 13.00 ~ 19.97     | 19.90        | 6.00         |                            | 25 | 2.8                  |
| E           | EBJEL | 25 |              | 18.00 ~ 24.97     | 24.90        | 6.00         |                            |    |                      |
| G           | EBJGL | 32 |              | 22.00 ~ 31.97     | 31.90        | 6.00         |                            |    |                      |



Price

**Quotation**



Order

Catalog No. — L — P — W — R (R only)

EBJAS 13 — 71 — P12.56



Days to Ship

**Quotation**



Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC, etc.)

EBJAS 13 — LC78.5 — P12.56

| Alteration                    | Code       | A                                                                                                                                                                                                     | D R E G                                                                                                                                        | 1Code            |
|-------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <br><b>Alterations to tip</b> | <b>PC</b>  | Tip diameter change<br>PC ≥ PCmin.<br>0.01mm increments<br>(If combined with PKC, 0.001mm increments can be selected.)<br>D PCmin.<br>10 2.80<br>13 5.00<br>16 8.00<br>20 9.00<br>25 9.00<br>32 15.00 | Tip diameter change<br>PC-WC ≥ PC-WCmin.<br>0.01mm increments<br>D PC-WCmin.<br>10 2.80<br>13 5.00<br>16 5.00<br>20 5.00<br>25 5.00<br>32 5.00 | <b>Quotation</b> |
|                               | <b>BC</b>  | Tip length change<br>2 ≤ BC < B<br>0.1mm increments                                                                                                                                                   |                                                                                                                                                |                  |
|                               | <b>PKC</b> | Tip tolerance change<br>P +0.01 → +0.005<br>0                                                                                                                                                         | Tip tolerance change<br>P-W ± 0.01 → +0.01<br>0                                                                                                |                  |

| Alteration                            | Code       | A                                                                                                                                                                 | D R E G                                                | 1Code            |
|---------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------|
| <br><b>Alterations to tip</b>         | <b>PRC</b> | Rounding of tip side edge<br>0.3 ≤ PRC ≤ 1<br>0.1mm increments<br>⊙ PRC ≤ (P-d-0.5)/2<br>⊗ Cannot be combined with PCC.                                           |                                                        | <b>Quotation</b> |
|                                       | <b>PCC</b> | Chamfering to tip side edge<br>0.3 ≤ PCC ≤ 1<br>0.1mm increments<br>⊙ PCC ≤ (P-d-0.5)/2<br>⊗ Cannot be combined with PRC.                                         |                                                        |                  |
| <br><b>Alterations to full length</b> | <b>LC</b>  | Full length change<br>L - (B-2) ≤ LC < L<br>0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)<br>⊙ Tip length B is shortened by (L-LC). |                                                        | <b>Quotation</b> |
|                                       | <b>LKC</b> | Full length tolerance change<br>L +0.3 → +0.05<br>0                                                                                                               |                                                        |                  |
| <b>Others</b>                         | <b>KC</b>  |                                                                                                                                                                   | 0° 270° 90° 180°<br>Ball position change 1° increments |                  |

# BALL-LOCK PUNCHES

—LIGHT LOAD TYPE WITH WRENCH FLAT—

| Shank type                                                                                                                                                                                                                                                                                                 |                    | Catalog No.                    |                    | The tip shape can be selected from Tip shape A ~ G in the figure below. |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------|--------------------|-------------------------------------------------------------------------|--|
|                                                                                                                                                                                                                                                                                                            |                    | Type                           | Tip shape          | B<br>Tip length                                                         |  |
| —With wrench flat—                                                                                                                                                                                                                                                                                         | RoHS               | Equivalent to SKD11 60 ~ 63HRC | <br><br><br><br>   | <br>                                                                    |  |
| <p>The wrench flat is used to check that the punch is correctly locked in place.  P.665</p>                                                                                                                                                                                                                |                    |                                |                    |                                                                         |  |
| Tip shape <b>A</b>                                                                                                                                                                                                                                                                                         | Tip shape <b>D</b> | Tip shape <b>R</b>             | Tip shape <b>E</b> | Tip shape <b>G</b>                                                      |  |
|                                                                                                                                                                                                                                                                                                            |                    |                                |                    |                                                                         |  |
| <p> <math>P \geq W</math><br/> <math>R=0</math> can be selected.<br/> <math>K = \sqrt{P^2 + W^2}</math> </p> <p> <math>P \geq W</math><br/> <math>0.15 \leq R &lt; \frac{W}{2}</math><br/> <math>K = \sqrt{(P-2R)^2 + (W-2R)^2} + 2R</math> </p> <p> <math>P &gt; W</math><br/> <math>P &gt; W</math> </p> |                    |                                |                    |                                                                         |  |

| Catalog No. |    | L              | 0.01mm increments  |              |              |                         | B  | F  |
|-------------|----|----------------|--------------------|--------------|--------------|-------------------------|----|----|
| Type        | D  |                | (A)<br>min. P max. | D<br>P-Kmax. | R<br>P-Wmin. | R<br>P                  |    |    |
| S           | 10 | 63 71 74 80 90 | 3.00 ~ 9.97        | 9.90         | 2.50         | 0.15 ≤ R < W/2 (B only) | 13 | 8  |
| A           | 13 |                | 6.00 ~ 12.97       | 12.90        | 3.00         |                         | 13 | 10 |
| D           | 16 |                | 10.00 ~ 15.97      | 15.90        | 4.00         |                         | 17 | 13 |
| D           | 20 |                | 13.00 ~ 19.97      | 19.90        | 5.00         |                         | 19 | 17 |
| E           | 25 |                | 18.00 ~ 24.97      | 24.90        | 6.00         |                         | 22 | 22 |
| G           | 32 |                | 22.00 ~ 31.97      | 31.90        | 7.00         |                         | 29 | 29 |
| S           | 10 | 71 74 80 90    | 3.00 ~ 9.97        | 9.90         | 2.50         |                         | 19 | 8  |
| A           | 13 |                | 6.00 ~ 12.97       | 12.90        | 3.00         |                         | 19 | 10 |
| D           | 16 |                | 10.00 ~ 15.97      | 15.90        | 4.00         |                         | 25 | 13 |
| D           | 20 |                | 13.00 ~ 19.97      | 19.90        | 5.00         |                         | 25 | 17 |
| E           | 25 |                | 18.00 ~ 24.97      | 24.90        | 6.00         |                         | 25 | 22 |
| G           | 32 |                | 22.00 ~ 31.97      | 31.90        | 7.00         |                         | 29 | 29 |



Price

Quotation



Order

Catalog No. — L — P — W — R (R only)  
KLPDL 16 — 80 — P10.33 — W8.64



Days to Ship

Quotation



Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC, etc.)  
KLPRS 16 — LC70.5 — P12.00 — W10.00 — R3.00 — BC15.5

| Alteration         | Code                                                                                                                                 | (A)                                                                                                                                                                 | D R E G                                                                         | 1Code     |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------|-------|-------------|----|-------------|----|--------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|-------------|---|-------------|----|-------------|----|-------------|----|--------|----|
| Alterations to tip | PC                                                                                                                                   | Tip diameter change<br>$PC \geq \frac{P_{min}}{2}$<br>0.01mm increments<br>(If combined with PKC, 0.001mm increments can be selected.)                              | Tip diameter change<br>$PC \geq \frac{P \cdot W_{min}}{2}$<br>0.01mm increments | Quotation |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
|                    | WC                                                                                                                                   | <table><tr><th>P</th><th>Bmax.</th></tr><tr><td>1.50 ~ 1.99</td><td>20</td></tr><tr><td>2.00 ~ 3.99</td><td>35</td></tr><tr><td>4.00 ~</td><td>45</td></tr></table> | P                                                                               |           | Bmax. | 1.50 ~ 1.99 | 20 | 2.00 ~ 3.99 | 35 | 4.00 ~ | 45 | <table><tr><th>P-W</th><th>Bmax.</th></tr><tr><td>1.25 ~ 1.49</td><td>8</td></tr><tr><td>1.50 ~ 1.99</td><td>13</td></tr><tr><td>2.00 ~ 3.49</td><td>19</td></tr><tr><td>3.50 ~ 4.99</td><td>25</td></tr><tr><td>5.00 ~</td><td>30</td></tr></table> | P-W | Bmax. | 1.25 ~ 1.49 | 8 | 1.50 ~ 1.99 | 13 | 2.00 ~ 3.49 | 19 | 3.50 ~ 4.99 | 25 | 5.00 ~ | 30 |
|                    | P                                                                                                                                    | Bmax.                                                                                                                                                               |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| 1.50 ~ 1.99        | 20                                                                                                                                   |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| 2.00 ~ 3.99        | 35                                                                                                                                   |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| 4.00 ~             | 45                                                                                                                                   |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| P-W                | Bmax.                                                                                                                                |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| 1.25 ~ 1.49        | 8                                                                                                                                    |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| 1.50 ~ 1.99        | 13                                                                                                                                   |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| 2.00 ~ 3.49        | 19                                                                                                                                   |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| 3.50 ~ 4.99        | 25                                                                                                                                   |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| 5.00 ~             | 30                                                                                                                                   |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| BC                 | Tip length change<br>$2 \leq BC \leq B_{max}$ 0.1mm increments<br>Full length (L) must be at least 45mm longer than tip length (BC). |                                                                                                                                                                     |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |
| PKC                | Tip tolerance change<br>$P \pm 0.01 \Rightarrow +0.005$<br>$0$                                                                       | Tip tolerance change<br>$P \cdot W \pm 0.01 \Rightarrow +0.01$<br>$0$                                                                                               |                                                                                 |           |       |             |    |             |    |        |    |                                                                                                                                                                                                                                                      |     |       |             |   |             |    |             |    |             |    |        |    |

| Alteration                 | Code | (A)                                                                                                                                                                                                                                                     | D R E G                                                                            | 1Code     |
|----------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------|
| Alterations to tip         | PRC  | Rounding of tip side edge<br>$0.3 \leq PRC \leq 1$<br>0.1mm increments<br>$PRC \leq (P-0.2)/2$<br>Cannot be combined with PCC.                                                                                                                          |                                                                                    | Quotation |
|                            | PCC  | Chamfering to tip side edge<br>$0.3 \leq PCC \leq 1$<br>0.1mm increments<br>$PCC \leq (P-0.2)/2$<br>Cannot be combined with PRC.                                                                                                                        |                                                                                    |           |
|                            | LC   | Full length change<br>$45 + B(BC) \leq LC < L$<br>0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)<br>If difference between full length (LC) and tip length (B) is 45mm or less, tip length is adjusted to (Full length-45). |                                                                                    |           |
| Alterations to full length | LKC  | Full length tolerance change<br>$L \pm 0.3 \rightarrow +0.05$<br>$0$                                                                                                                                                                                    |                                                                                    |           |
| Others                     | KC   |                                                                                                                                                                                                                                                         | Ball position change 1° increments<br>$270^\circ$ $0^\circ$ $90^\circ$ $180^\circ$ |           |

# BALL-LOCK PUNCHES

## —HEAVY LOAD TYPE WITH WRENCH FLAT—

| Shank type                                                                                                                                    |                                                                                                          | Catalog No.                                                                                                  |                                   | The tip shape can be selected from Tip shape A ~ G in the figure below. |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------|--|
|                                                                                                                                               |                                                                                                          | Type                                                                                                         | Tip shape                         | B<br>Tip length                                                         |  |
| —With wrench flat—<br><br>RoHS<br>SKH51<br>61 ~ 64HRC<br>The wrench flat is used to check that the punch is correctly locked in place.  P.665 |                                                                                                          | KBP                                                                                                          | <br><br><br><br>                  | <br>                                                                    |  |
| <b>Tip shape A</b><br><br>$\phi 0.01$ A<br>$D_{g5}$<br>$P \pm 0.01$<br>$F$                                                                    | <b>Tip shape D</b><br><br>$R \leq 0.2$<br>$P \geq W$<br>$R=0$ can be selected.<br>$K = \sqrt{P^2 + W^2}$ | <b>Tip shape R</b><br><br>$P \geq W$<br>$0.15 \leq R < \frac{W}{2}$<br>$K = \sqrt{(P-2R)^2 + (W-2R)^2} + 2R$ | <b>Tip shape E</b><br><br>$P > W$ | <b>Tip shape G</b><br><br>$P > W$                                       |  |

| Catalog No. |    | L            | 0.01mm increments  |              |              |                                      | B  | F  |
|-------------|----|--------------|--------------------|--------------|--------------|--------------------------------------|----|----|
| Type        | D  |              | (A)<br>min. P max. | D<br>P-Kmax. | E<br>P-Wmin. | G<br>R                               |    |    |
| <br>KBPAS   | 10 | 71 80 90 100 | 3.00 ~ 9.97        | 9.90         | 2.50         | $0.15 \leq R < \frac{W}{2}$ (B only) | 13 | 8  |
| <br>KBPD    | 13 |              | 6.00 ~ 12.97       | 12.90        | 3.00         |                                      | 10 | 10 |
| <br>KBPRS   | 16 |              | 10.00 ~ 15.97      | 15.90        | 4.00         |                                      | 13 | 13 |
| <br>KBPE    | 20 |              | 13.00 ~ 19.97      | 19.90        | 5.00         |                                      | 17 | 17 |
| <br>KBPGS   | 25 |              | 18.00 ~ 24.97      | 24.90        | 6.00         |                                      | 19 | 22 |
| <br>KBPGS   | 32 |              | 22.00 ~ 31.97      | 31.90        | 7.00         |                                      | 29 | 29 |
| <br>KBPAL   | 10 | 80 90 100    | 3.00 ~ 9.97        | 9.90         | 2.50         |                                      | 19 | 8  |
| <br>KBPD    | 13 |              | 6.00 ~ 12.97       | 12.90        | 3.00         |                                      | 10 | 10 |
| <br>KBPR    | 16 |              | 10.00 ~ 15.97      | 15.90        | 4.00         |                                      | 13 | 13 |
| <br>KBPE    | 20 |              | 13.00 ~ 19.97      | 19.90        | 5.00         |                                      | 17 | 17 |
| <br>KBPG    | 25 |              | 18.00 ~ 24.97      | 24.90        | 6.00         |                                      | 22 | 22 |
| <br>KBPG    | 32 |              | 22.00 ~ 31.97      | 31.90        | 7.00         |                                      | 29 | 29 |



Price

Quotation



Order

Catalog No. — L — P — W — R (B only)  
KBPR 32 — 100 — P26.20 — W14.00 — R3.00



Days to Ship

Quotation



Alterations

Catalog No. — L (LC) — P (PC) — W (WC) — R — (BC·KC, etc.)  
KBPR 32 — 100 — P26.20 — W14.00 — KC90

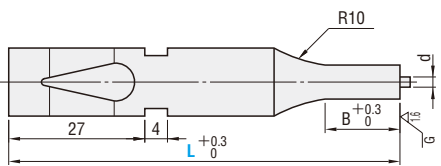
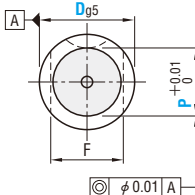
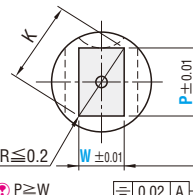
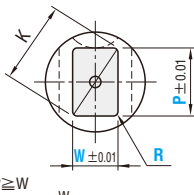
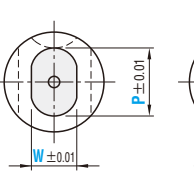
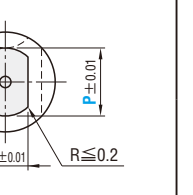
| Alteration         | Code                                                                                                                                 | (A)                                                                                                                                                                                                                                                                                                                                                   | D R E G | 1Code |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|-------------|----|-------------|----|-------------|----|--------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|-------------|---|-------------|----|-------------|----|-------------|----|--------|----|-----------|
| Alterations to tip | PC<br>WC                                                                                                                             | Tip diameter change<br>$PC \geq \frac{P_{min}}{2}$<br>0.01mm increments<br>(If combined with PKC, 0.001mm increments can be selected.)<br><table><tr><th>P</th><th>Bmax.</th></tr><tr><td>1.50 ~ 1.99</td><td>20</td></tr><tr><td>2.00 ~ 3.99</td><td>35</td></tr><tr><td>4.00 ~ 5.99</td><td>45</td></tr><tr><td>6.00 ~</td><td>50</td></tr></table> | P       | Bmax. | 1.50 ~ 1.99 | 20 | 2.00 ~ 3.99 | 35 | 4.00 ~ 5.99 | 45 | 6.00 ~ | 50 | Tip diameter change<br>$PC \geq \frac{P-W_{min}}{2}$<br>0.01mm increments<br><table><tr><th>P-W</th><th>Bmax.</th></tr><tr><td>1.25 ~ 1.49</td><td>8</td></tr><tr><td>1.50 ~ 1.99</td><td>13</td></tr><tr><td>2.00 ~ 3.49</td><td>19</td></tr><tr><td>3.50 ~ 4.99</td><td>25</td></tr><tr><td>5.00 ~</td><td>30</td></tr></table> | P-W | Bmax. | 1.25 ~ 1.49 | 8 | 1.50 ~ 1.99 | 13 | 2.00 ~ 3.49 | 19 | 3.50 ~ 4.99 | 25 | 5.00 ~ | 30 | Quotation |
|                    | P                                                                                                                                    | Bmax.                                                                                                                                                                                                                                                                                                                                                 |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
|                    | 1.50 ~ 1.99                                                                                                                          | 20                                                                                                                                                                                                                                                                                                                                                    |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 2.00 ~ 3.99        | 35                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 4.00 ~ 5.99        | 45                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 6.00 ~             | 50                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| P-W                | Bmax.                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 1.25 ~ 1.49        | 8                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 1.50 ~ 1.99        | 13                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 2.00 ~ 3.49        | 19                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 3.50 ~ 4.99        | 25                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| 5.00 ~             | 30                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| BC                 | Tip length change<br>$2 \leq BC \leq B_{max}$ 0.1mm increments<br>Full length (L) must be at least 50mm longer than tip length (BC). |                                                                                                                                                                                                                                                                                                                                                       |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |
| PKC                | Tip tolerance change<br>$P + 0.01 \rightarrow +0.005$<br>0                                                                           | Tip tolerance change<br>$P \cdot W \pm 0.01 \rightarrow +0.01$<br>0                                                                                                                                                                                                                                                                                   |         |       |             |    |             |    |             |    |        |    |                                                                                                                                                                                                                                                                                                                                   |     |       |             |   |             |    |             |    |             |    |        |    |           |

| Alteration                     | Code | (A)                                                                                                                                                                                                                                                     | D R E G                                | 1Code |
|--------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|
| <br>Alterations to tip         | PRC  | Rounding of tip side edge<br>$0.3 \leq PRC \leq 1$<br>0.1 mm increments<br>PRC $\leq (P-0.2)/2$<br>Cannot be combined with PCC.                                                                                                                         |                                        |       |
|                                | PCC  | Chamfering to tip side edge<br>$0.3 \leq PCC \leq 1$<br>0.1 mm increments<br>PCC $\leq (P-0.2)/2$<br>Cannot be combined with PRC.                                                                                                                       |                                        |       |
| <br>Alterations to full length | LC   | Full length change<br>$50 + B(BC) \leq LC < L$<br>0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)<br>If difference between full length (LC) and tip length (B) is 50mm or less, tip length is adjusted to (Full length—50). |                                        |       |
|                                | LKC  | Full length tolerance change<br>$L + 0.3 \rightarrow +0.05$<br>$0$                                                                                                                                                                                      |                                        |       |
| Others                         | KC   |                                                                                                                                                                                                                                                         | <br>Ball position change 1° increments |       |



# BALL-LOCK JECTOR PUNCHES

—LIGHT LOAD TYPE WITH WRENCH FLAT—

| Shank type                                                                                                                                                                                                                             | M<br>H | Catalog No.                                                                       |                                                                                       |                                                                                    | The tip shape can be selected from Tip shape A ~ G in the figure below.             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                        |        | Type                                                                              | Tip shape                                                                             | B<br>Tip length                                                                    |                                                                                     |
| —With wrench flat—<br><br>RoHS<br>Equivalent to SKD11 60~63HRC<br>The wrench flat is used to check that the punch is correctly locked in place. P.665 |        | KLJ                                                                               | A<br>D<br>R<br>E<br>G                                                                 | S<br>L                                                                             |   |
| Tip shape A                                                                                                                                                                                                                            |        | Tip shape D                                                                       | Tip shape R                                                                           | Tip shape E                                                                        | Tip shape G                                                                         |
|                                                                                                                                                       |        |  |      |  |  |
| $\phi 0.01$ A                                                                                                                                                                                                                          |        | $R \leq 0.2$<br>$P \geq W$<br>$R=0$ can be selected.<br>$K = \sqrt{P^2 + W^2}$    | $P \geq W$<br>$0.15 \leq R \leq \frac{W}{2}$<br>$K = \sqrt{(P-2R)^2 + (W-2R)^2 + 2R}$ | $P > W$                                                                            | $P > W$                                                                             |

| Catalog No. |    | L              | 0.01mm increments |         |         |   |   | B  | F  | d<br>(Hole diameter) |
|-------------|----|----------------|-------------------|---------|---------|---|---|----|----|----------------------|
| Type        | D  |                | A                 | D       | R       | E | G |    |    |                      |
|             |    |                | min. Pmax.        | P-Kmax. | P-Wmin. | P | R |    |    |                      |
| S           | 10 | 63 71 74 80 90 | 3.00 ~ 9.97       | 9.90    | 3.00    |   |   | 13 | 8  | 1.5                  |
| A KLJAS     | 13 |                | 6.00 ~ 12.97      | 12.90   | 6.00    |   |   |    | 10 | 1.8                  |
| D KLJDS     | 16 |                | 10.00 ~ 15.97     | 15.90   | 6.00    |   |   | 19 | 13 |                      |
| R KLJRS     | 20 |                | 13.00 ~ 19.97     | 19.90   | 6.00    |   |   |    | 17 |                      |
| E KLJES     | 25 |                | 18.00 ~ 24.97     | 24.90   | 6.00    |   |   |    | 22 | 2.8                  |
| G KLJGS     | 32 | 71 74 80 90    | 22.00 ~ 31.97     | 31.90   | 6.00    |   |   |    | 29 |                      |
| S           | 10 |                | 3.00 ~ 9.97       | 9.90    | 3.00    |   |   | 19 | 8  | 1.5                  |
| A KLJAL     | 13 |                | 6.00 ~ 12.97      | 12.90   | 6.00    |   |   |    | 10 | 1.8                  |
| D KLJDL     | 16 |                | 10.00 ~ 15.97     | 15.90   | 6.00    |   |   | 25 | 13 |                      |
| R KLJRL     | 20 |                | 13.00 ~ 19.97     | 19.90   | 6.00    |   |   |    | 17 |                      |
| E KLJEL     | 25 |                | 18.00 ~ 24.97     | 24.90   | 6.00    |   |   |    | 22 | 2.8                  |
| G KLJGL     | 32 |                | 22.00 ~ 31.97     | 31.90   | 6.00    |   |   |    | 29 |                      |



Price

Quotation



Order

Catalog No. — L — P — W — R (R only)  
KLJDS 20 — 71 — P16.00 — W10.00



Days to Ship

Quotation



Alterations

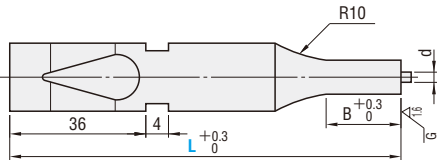
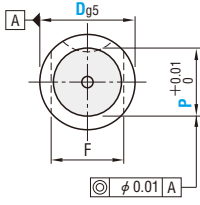
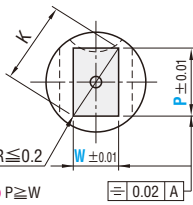
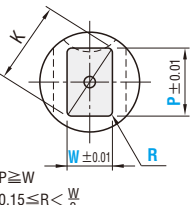
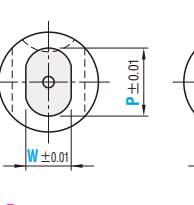
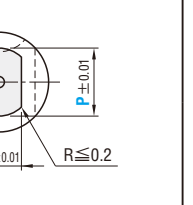
Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC-KC, etc.)  
KLJDS 20 — 71 — P16.00 — W10.00 — PKC

| Alteration         | Code                                                     | A                                                                                                                                                                                                                                                                   | D R E G                                                                            | 1Code     |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
|--------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------|---------------------|----|------|----|------|----|------|----|------|----|------|----|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------|----|------|----|------|----|------|----|------|----|------|----|
| Alterations to tip | PC<br>WC                                                 | Tip diameter change<br>$PC \geq PC_{min}$ .<br>0.01mm increments<br>(If combined with PKC, 0.001mm increments can be selected.)                                                                                                                                     | Tip diameter change<br>$PC \cdot WC \geq PC \cdot WC_{min}$ .<br>0.01mm increments | Quotation |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
|                    |                                                          | <table><tr><th>D</th><th>PC<sub>min</sub>.</th></tr><tr><td>10</td><td>2.80</td></tr><tr><td>13</td><td>5.00</td></tr><tr><td>16</td><td>8.00</td></tr><tr><td>20</td><td>9.00</td></tr><tr><td>25</td><td>9.00</td></tr><tr><td>32</td><td>15.00</td></tr></table> | D                                                                                  |           | PC <sub>min</sub> . | 10 | 2.80 | 13 | 5.00 | 16 | 8.00 | 20 | 9.00 | 25 | 9.00 | 32 | 15.00 | <table><tr><th>D</th><th>PC·WC<sub>min</sub>.</th></tr><tr><td>10</td><td>2.80</td></tr><tr><td>13</td><td>5.00</td></tr><tr><td>16</td><td>5.00</td></tr><tr><td>20</td><td>5.00</td></tr><tr><td>25</td><td>5.00</td></tr><tr><td>32</td><td>5.00</td></tr></table> | D | PC·WC <sub>min</sub> . | 10 | 2.80 | 13 | 5.00 | 16 | 5.00 | 20 | 5.00 | 25 | 5.00 | 32 |
|                    | D                                                        | PC <sub>min</sub> .                                                                                                                                                                                                                                                 |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
|                    | 10                                                       | 2.80                                                                                                                                                                                                                                                                |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 13                 | 5.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 16                 | 8.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 20                 | 9.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 25                 | 9.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 32                 | 15.00                                                    |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| D                  | PC·WC <sub>min</sub> .                                   |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 10                 | 2.80                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 13                 | 5.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 16                 | 5.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 20                 | 5.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 25                 | 5.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| 32                 | 5.00                                                     |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| BC                 | Tip length change<br>$2 \leq BC < B$<br>0.1mm increments |                                                                                                                                                                                                                                                                     |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |
| PKC                | Tip tolerance change<br>$P+0.01 \Rightarrow +0.005$      | Tip tolerance change<br>$P \cdot W \pm 0.01 \Rightarrow +0.01$                                                                                                                                                                                                      |                                                                                    |           |                     |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                                       |   |                        |    |      |    |      |    |      |    |      |    |      |    |

| Alteration                 | Code | A                                                                                                                                                                     | D R E G                                                          | 1Code     |
|----------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------|
| Alterations to tip         | PRC  | Rounding of tip side edge<br>$0.3 \leq PRC \leq 1$<br>0.1mm increments<br>$\text{PRC} \leq (P-d-0.5)/2$<br>Cannot be combined with PCC.                               |                                                                  | Quotation |
|                            | PCC  | Chamfering to tip side edge<br>$0.3 \leq PCC \leq 1$<br>0.1mm increments<br>$\text{PCC} \leq (P-d-0.5)/2$<br>Cannot be combined with PRC.                             |                                                                  |           |
| Alterations to full length | LC   | Full length change<br>$L-(B-2) \leq LC < L$<br>0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)<br>Tip length B is shortened by $(L-LC)$ . |                                                                  | Quotation |
|                            | LKC  | Full length tolerance change<br>$L+0.3$ $\rightarrow$ $+0.05$                                                                                                         |                                                                  |           |
| Others                     | KC   |                                                                                                                                                                       | $270^\circ$ $\rightarrow$ $90^\circ$ change $1^\circ$ increments |           |

# BALL-LOCK JECTOR PUNCHES

—HEAVY LOAD TYPE WITH WRENCH FLAT—

| Shank type                                                                                                                                                                                                                  | M<br>H                                                                                           | Catalog No.                                                                                      |                                                                                                   |                                                                                                    | The tip shape can be selected from Tip shape A ~ G in the figure below.            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                             |                                                                                                  | Type                                                                                             | Tip shape                                                                                         | B<br>Tip length                                                                                    |                                                                                    |
| —With wrench flat—<br><br>RoHS<br>SKH51<br>61~64HRC<br>The wrench flat is used to check that the punch is correctly locked in place. P.665 |                                                                                                  | KBJ                                                                                              | A<br>D<br>R<br>E<br>G                                                                             | S<br>L                                                                                             |  |
| Tip shape A<br>                                                                                                                            | Tip shape D<br> | Tip shape R<br> | Tip shape E<br> | Tip shape G<br> |                                                                                    |
| $\phi 0.01$ A                                                                                                                                                                                                               | $P \geq W$<br>$R=0$ can be selected.<br>$K = \sqrt{P^2 + W^2}$                                   | $P \geq W$<br>$0.15 \leq R < \frac{W}{2}$<br>$K = \sqrt{(P-2R)^2 + (W-2R)^2} + 2R$               | $P > W$                                                                                           | $P > W$                                                                                            |                                                                                    |

| Catalog No. |                                                                                   | L  |    | 0.01mm increments  |                      |               |               |       | B    | F                             | d<br>(Hole diameter) |     |     |
|-------------|-----------------------------------------------------------------------------------|----|----|--------------------|----------------------|---------------|---------------|-------|------|-------------------------------|----------------------|-----|-----|
| Type        | D                                                                                 |    |    | (A)<br>min. P.max. | D<br>P-Kmax. P-Wmin. | R<br>R        | R             |       |      |                               |                      |     |     |
| S           |  | 10 | 71 | 80                 | 90                   | 100           | 3.00 ~ 9.97   | 9.90  | 3.00 | W / Z<br>0.15 ≤ R < 0.20 only | 13                   | 8   | 1.5 |
| A           | KBJAS                                                                             | 13 |    |                    |                      |               | 6.00 ~ 12.97  | 12.90 | 6.00 |                               |                      | 10  | 1.8 |
| D           | KBJDS                                                                             | 16 |    |                    |                      |               | 10.00 ~ 15.97 | 15.90 | 6.00 |                               | 13                   |     | 2.8 |
| R           | KBJRS                                                                             | 20 |    |                    |                      |               | 13.00 ~ 19.97 | 19.90 | 6.00 |                               |                      | 17  |     |
| E           | KBJES                                                                             | 25 |    |                    |                      |               | 18.00 ~ 24.97 | 24.90 | 6.00 |                               | 22                   |     |     |
| G           | KBJGS                                                                             | 32 |    |                    |                      |               | 22.00 ~ 31.97 | 31.90 | 6.00 |                               |                      | 29  |     |
| L           |  | 10 | 80 | 90                 | 100                  | 3.00 ~ 9.97   | 9.90          | 3.00  | 19   |                               | 8                    | 1.5 |     |
| A           | KBJAL                                                                             | 13 |    |                    |                      | 6.00 ~ 12.97  | 12.90         | 6.00  |      |                               | 10                   | 1.8 |     |
| D           | KBJDL                                                                             | 16 |    |                    |                      | 10.00 ~ 15.97 | 15.90         | 6.00  | 13   |                               |                      | 2.8 |     |
| R           | KBJRL                                                                             | 20 |    |                    |                      | 13.00 ~ 19.97 | 19.90         | 6.00  |      |                               | 17                   |     |     |
| E           | KBJEL                                                                             | 25 |    |                    |                      | 18.00 ~ 24.97 | 24.90         | 6.00  | 22   |                               |                      |     |     |
| G           | KBJGL                                                                             | 32 |    |                    |                      | 22.00 ~ 31.97 | 31.90         | 6.00  |      |                               | 29                   |     |     |



Price

Quotation



Order

Catalog No. — L — P — W — R (R only)  
KBJDL 20 — 80 — P16.00 — W10.00



Days to Ship

Quotation



Alterations

Catalog No. — L (LC) — P (PC) — W (WC) — R — (BC·KC, etc.)  
KBJDL 20 — 80 — P16.00 — W10.00 — LC

| Alteration         | Code                                                         | A                                                                                                                                                                                                                                                        | D R E G                                                                            | 1Code     |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
|--------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------|--------|----|------|----|------|----|------|----|------|----|------|----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------|----|------|----|------|----|------|----|------|----|------|----|
| Alterations to tip | PC<br>WC                                                     | Tip diameter change<br>$PC \geq PC_{min}$ .<br>0.01mm increments<br>(If combined with PKC, 0.001mm increments can be selected.)                                                                                                                          | Tip diameter change<br>$PC \cdot WC \geq PC \cdot WC_{min}$ .<br>0.01mm increments | Quotation |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
|                    |                                                              | <table><tr><th>D</th><th>PCmin.</th></tr><tr><td>10</td><td>2.80</td></tr><tr><td>13</td><td>5.00</td></tr><tr><td>16</td><td>8.00</td></tr><tr><td>20</td><td>9.00</td></tr><tr><td>25</td><td>9.00</td></tr><tr><td>32</td><td>15.00</td></tr></table> | D                                                                                  |           | PCmin. | 10 | 2.80 | 13 | 5.00 | 16 | 8.00 | 20 | 9.00 | 25 | 9.00 | 32 | 15.00 | <table><tr><th>D</th><th>PC·WCmin.</th></tr><tr><td>10</td><td>2.80</td></tr><tr><td>13</td><td>5.00</td></tr><tr><td>16</td><td>5.00</td></tr><tr><td>20</td><td>5.00</td></tr><tr><td>25</td><td>5.00</td></tr><tr><td>32</td><td>5.00</td></tr></table> | D | PC·WCmin. | 10 | 2.80 | 13 | 5.00 | 16 | 5.00 | 20 | 5.00 | 25 | 5.00 | 32 |
|                    | D                                                            | PCmin.                                                                                                                                                                                                                                                   |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
|                    | 10                                                           | 2.80                                                                                                                                                                                                                                                     |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 13                 | 5.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 16                 | 8.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 20                 | 9.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 25                 | 9.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 32                 | 15.00                                                        |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| D                  | PC·WCmin.                                                    |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 10                 | 2.80                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 13                 | 5.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 16                 | 5.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 20                 | 5.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 25                 | 5.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| 32                 | 5.00                                                         |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| BC                 | Tip length change<br>$2 \leq BC < B$<br>0.1mm increments     |                                                                                                                                                                                                                                                          |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |
| PKC                | Tip tolerance change<br>$P + 0.01 \rightarrow +0.005$<br>$0$ | Tip tolerance change<br>$P \cdot W \pm 0.01 \rightarrow +0.01$<br>$0$                                                                                                                                                                                    |                                                                                    |           |        |    |      |    |      |    |      |    |      |    |      |    |       |                                                                                                                                                                                                                                                            |   |           |    |      |    |      |    |      |    |      |    |      |    |

| Alteration                 | Code | A                                                                                                                                                                       | D R E G                                                                                     | 1Code     |
|----------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------|
| Alterations to tip         | PRC  | Rounding of tip side edge<br>$0.3 \leq PRC \leq 1$<br>0.1mm increments<br>$\text{PRC} \leq (P-d-0.5)/2$<br>Cannot be combined with PCC.                                 | —                                                                                           | Quotation |
|                            | PCC  | Chamfering to tip side edge<br>$0.3 \leq PCC \leq 1$<br>0.1mm increments<br>$\text{PCC} \leq (P-d-0.5)/2$<br>Cannot be combined with PRC.                               | —                                                                                           |           |
| Alterations to full length | LC   | Full length change<br>$L - (B-2) \leq LC < L$<br>0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)<br>Tip length B is shortened by $(L-LC)$ . | —                                                                                           | Quotation |
|                            | LKC  | Full length tolerance change<br>$L + 0.3 \rightarrow +0.05$<br>$0$                                                                                                      | —                                                                                           |           |
| Others                     | KC   | —                                                                                                                                                                       | $0^\circ$<br>$270^\circ$<br>$90^\circ$<br>$180^\circ$<br>Ball position change 1° increments |           |

# BALL-LOCK PUNCH BLANKS

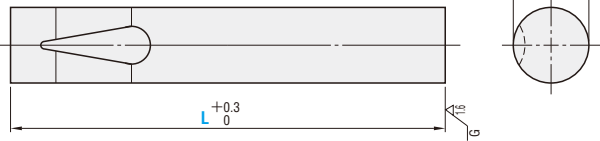
—ECONOMY—

| Applicable L dimension | Application       | Catalog No. | M                               |
|------------------------|-------------------|-------------|---------------------------------|
| 63・71・74・80・90         | Light load        | ELPB        | Equivalent to SKD11<br>60~63HRC |
|                        | Light-load jector | ELJB        |                                 |
| 71・80・90・100           | Heavy load        | EBPB        | SKH51<br>61~64HRC               |
|                        | Heavy-load jector | EBJB        |                                 |

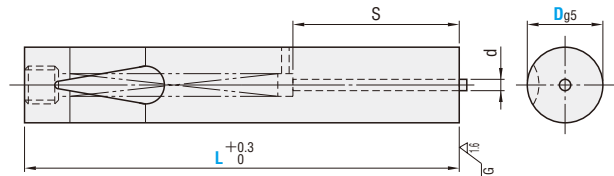
RoHS



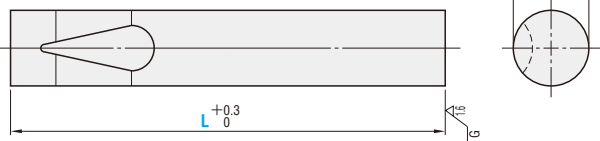
ELPB  
(Light load)



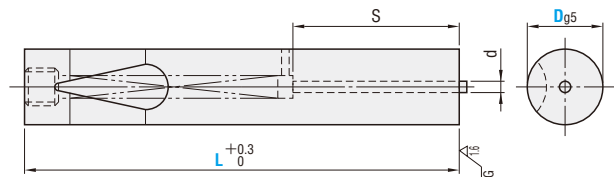
ELJB  
(Light load  
Jector)



EBPB  
(Heavy load)



EBJB  
(Heavy load  
Jector)



| Catalog No.                                                                |    | L          |    |    |    |    |            |    |    |     |     | d<br>(Hole diameter) | S |
|----------------------------------------------------------------------------|----|------------|----|----|----|----|------------|----|----|-----|-----|----------------------|---|
| Type                                                                       | D  | Light load |    |    |    |    | Heavy load |    |    |     |     |                      |   |
| (Light load)<br>(Light load+jector)<br>(Heavy load)<br>(Heavy load+jector) | 10 | 63         | 71 | 74 | 80 | 90 | 71         | 80 | 90 | 100 | 1.5 | 28                   |   |
|                                                                            | 13 |            |    |    |    |    |            |    |    |     | 1.8 |                      |   |
|                                                                            | 16 |            |    |    |    |    |            |    |    |     | 2.8 | 36                   |   |
|                                                                            | 20 |            |    |    |    |    |            |    |    |     |     |                      |   |
|                                                                            | 25 |            |    |    |    |    |            |    |    |     |     |                      |   |
|                                                                            | 32 |            |    |    |    |    |            |    |    |     |     |                      |   |



Order

Catalog No. — L  
ELPB 16 — 71



Price

Quotation



Days to Ship

Quotation



Alterations



Catalog No. — L(LC) — (LKC)  
ELPB 16 — LC72.5 — LKC

| Alteration                 | Code | Spec.                                                                                                                                         | 1Code     |
|----------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Alterations to full length | LC   | Full length change 0.1mm increments<br>Light load $50 \leq LC < 90$<br>Heavy load $60 \leq LC < 100$<br>⚠ S dimension is shortened by (L-LC). | Quotation |
|                            | LKC  | Full length tolerance change $L^{+0.3}_0 \Rightarrow +0.05_0$                                                                                 |           |

# BALL-LOCK PUNCH BLANKS

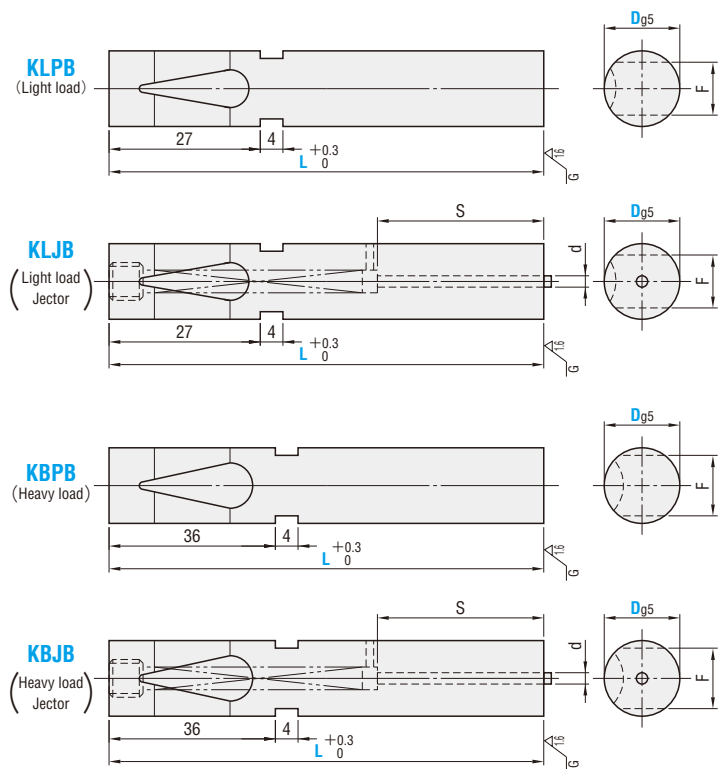
—TYPE WITH WRENCH FLAT—

| Applicable L dimension | Application       | Catalog No. | M                               |
|------------------------|-------------------|-------------|---------------------------------|
| 63・71・74・80・90         | Light load        | <b>KLPB</b> | Equivalent to SKD11<br>60~63HRC |
|                        | Light-load jector | <b>KLJB</b> |                                 |
| 71・80・90・100           | Heavy load        | <b>KBPB</b> | SKH51<br>61~64HRC               |
|                        | Heavy-load jector | <b>KBJB</b> |                                 |

RoHS



The wrench flat is used to check that the punch is correctly locked in place. P.665



| Catalog No.                                                                |    | L          |    |    |    |            |    |    |    | F   | d<br>(Hole diameter) | S   |    |
|----------------------------------------------------------------------------|----|------------|----|----|----|------------|----|----|----|-----|----------------------|-----|----|
| Type                                                                       | D  | Light load |    |    |    | Heavy load |    |    |    |     |                      |     |    |
| (Light load)<br>(Light load+jector)<br>(Heavy load)<br>(Heavy load+jector) | 10 | 63         | 71 | 74 | 80 | 90         | 71 | 80 | 90 | 100 | 8                    | 1.5 | 28 |
|                                                                            | 13 |            |    |    |    |            |    |    |    |     | 10                   | 1.8 |    |
|                                                                            | 16 |            |    |    |    |            |    |    |    |     | 13                   | 2.8 | 36 |
|                                                                            | 20 |            |    |    |    |            |    |    |    |     | 17                   |     |    |
|                                                                            | 25 |            |    |    |    |            |    |    |    |     | 22                   |     |    |
|                                                                            | 32 |            |    |    |    |            |    |    |    |     | 29                   |     |    |



Order

Catalog No. — L  
KLPB 16 — 71



Price

Quotation



Days to Ship

Quotation



Alterations



Catalog No. — L(LC) — (LKC)  
KLPB 16 — LC72.5  
KBJB 25 — 90 — LKC

| Alteration                 | Code    | Spec.                                                                                                                               | 1Code     |
|----------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Alterations to full length | <br>LC  | Full length change 0.1mm increments<br>Light load 50 ≤ LC < 90<br>Heavy load 60 ≤ LC < 100<br>S dimension is shortened by (L - LC). | Quotation |
|                            | <br>LKC | Full length tolerance change $L + \frac{0.3}{0} \Rightarrow + \frac{0.05}{0}$                                                       |           |

# BALL-LOCK BUTTON DIES

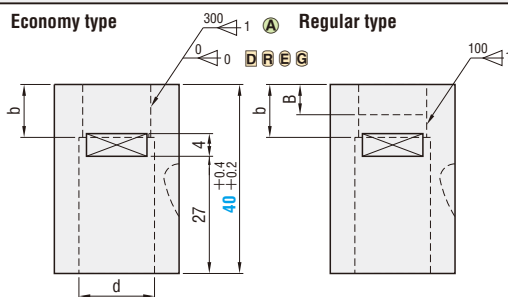
RoHS



| M H                               | Application  | Catalog No. |                       |
|-----------------------------------|--------------|-------------|-----------------------|
|                                   |              | Type        | Hole shape            |
| Equivalent to SKD11<br>60 ~ 63HRC | Economy type | ELD         | A<br>D<br>R<br>E<br>G |
|                                   | Regular type | LD          | A<br>D<br>R<br>E<br>G |

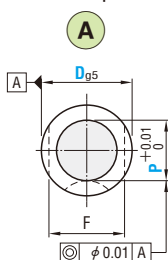
The wrench flat is used to check that the punch is correctly locked in place. **P.665**

The hole shape can be selected from Hole shape A ~ G in the figure below.

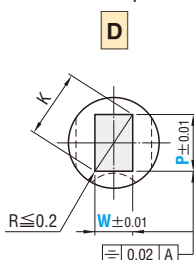


Use light-load type retainers. These dies cannot be used with heavy-load type retainers.

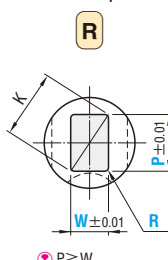
Hole shape



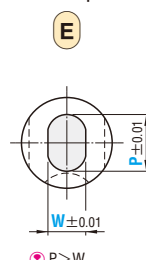
Hole shape



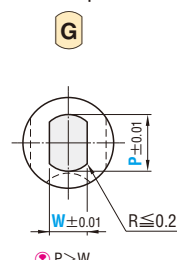
Hole shape



Hole shape



Hole shape



Catalog No.

Type

D

L

0.01mm increments

A

D R E G

R

B

b

d

F

Base unit price 1 ~ 9 pieces

ELDA

ELDD·ELDR  
ELDE·ELDG

LDA

LDD·LDR  
LDE·LDG

| Type         | D  | L  | 0.01mm increments |         |      |                         | B  | b  | d    | F  | Base unit price 1 ~ 9 pieces |     |                    |  |
|--------------|----|----|-------------------|---------|------|-------------------------|----|----|------|----|------------------------------|-----|--------------------|--|
|              |    |    | A                 | D R E G | R    | ELDA                    |    |    |      |    | ELDD·ELDR<br>ELDE·ELDG       | LDA | LDD·LDR<br>LDE·LDG |  |
| Economy type | 13 | 40 | 3.00 ~ 5.00       | 5.00    | 2.50 | 0.15 ≤ R < W/2 (R only) | 6  | 10 | 5.4  | 10 |                              |     |                    |  |
| Regular type | 16 |    | 3.50 ~ 8.00       | 8.00    | 3.00 |                         |    |    | 8.4  | 13 |                              |     |                    |  |
| A ELDA       | 20 |    | 7.00 ~ 11.00      | 11.00   | 3.00 |                         | 8  | 12 | 11.4 | 17 |                              |     |                    |  |
| D ELDD       | 25 |    | 10.00 ~ 16.00     | 16.00   | 4.00 |                         |    |    | 16.6 | 22 |                              |     |                    |  |
| R ELDR       | 32 |    | 15.00 ~ 20.00     | 20.00   | 5.00 |                         | 10 | 15 | 20.6 | 29 |                              |     |                    |  |
| E ELDE       | 38 |    | 19.00 ~ 26.00     | 26.00   | 5.00 |                         |    |    | 26.6 | 35 |                              |     |                    |  |

Quotation



Order

|             |    |        |        |            |
|-------------|----|--------|--------|------------|
| Catalog No. | L  | P      | W      | R (R only) |
| ELDR 32     | 40 | P16.00 | W10.00 | R4.90      |



Price

Quotation



Days to Ship

Quotation



Alterations



Catalog No. — L (LC) — P (PC) — W (WC) — R — (BC·KC, etc.)

ELDR 32 — 40 — P16.00 — W10.00 — R4.00 — KC45

| Alteration                 | Code | A          | D R E G                                                                                                                                                                                                                                          | 1Code     |
|----------------------------|------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Alterations to shaped hole |      | <b>PC</b>  | Shaped hole diameter change<br>$\min.: \frac{P \cdot W_{\min.}}{2} \leq PC < \frac{P}{W}$<br>0.01mm increments<br>⚡ If $PC1.25 \sim 1.99$ , $B \cdot b=4$ .<br><hr/> $\max.: \frac{P}{W} < PC \leq P \cdot K_{\max.} + 0.2$<br>0.01mm increments | Quotation |
|                            |      | <b>WC</b>  |                                                                                                                                                                                                                                                  |           |
|                            |      | <b>BC</b>  |                                                                                                                                                                                                                                                  |           |
|                            |      | <b>PKC</b> |                                                                                                                                                                                                                                                  |           |

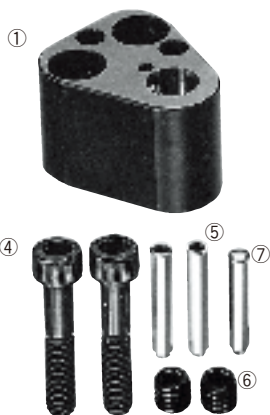
| Alteration                 | Code | A          | D R E G                                                                                                                                                                                              | 1Code                                     |
|----------------------------|------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Alterations to full length |      | <b>LC</b>  | Full length change<br>$33 \leq LC < 40$ 0.1mm increments<br>⚡ b dimension is shortened by $(L-LC)$ .<br>⚡ Regular type<br>If $L-LC > b-B$ , length of shaped hole straight portion B is $b-(L-LC)$ . | Quotation                                 |
|                            |      | <b>LKC</b> |                                                                                                                                                                                                      |                                           |
| Others                     |      | <b>KC</b>  | $L \begin{matrix} +0.4 \\ +0.2 \end{matrix} \Rightarrow \begin{matrix} +0.05 \\ 0 \end{matrix}$                                                                                                      | <br>Ball position change<br>1° increments |



—LIGHT LOAD TYPE (COMPACT) —

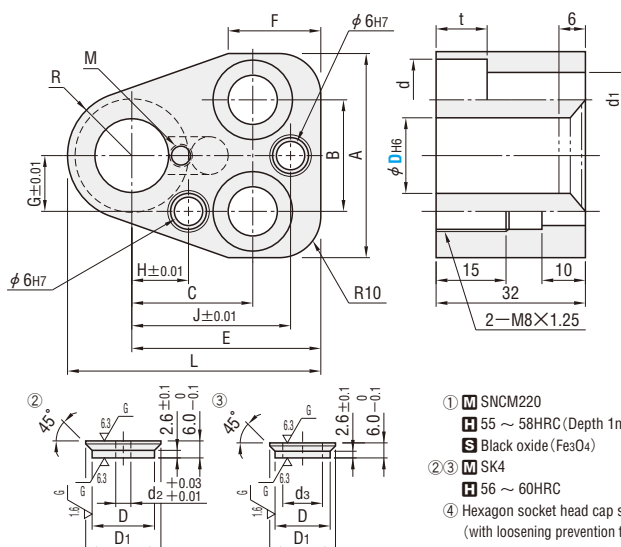
Refer to Notes on P.646.

| Application                       | Catalog No.   | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | D              |
|-----------------------------------|---------------|---|---|---|---|---|---|---|----------------|
| For punch                         | <b>CLN-P</b>  | ○ | ○ |   | ○ | ○ | ○ | ○ | <b>10 ~ 32</b> |
| For die                           | <b>CLN-D</b>  | ○ |   | ○ | ○ | ○ | ○ | ○ | <b>13 ~ 38</b> |
| Retainer body for punch<br>+ plug | <b>CLN-PP</b> | ○ | ○ |   |   |   |   |   | <b>10 ~ 32</b> |
| Retainer body for die<br>+ plug   | <b>CLN-DN</b> | ○ |   | ○ |   |   |   |   | <b>13 ~ 38</b> |



**RoHS**

⚠ Use these retainers for light load type punches. They cannot be used for heavy load type punches.



① **M** SNCM220

**H** 55 ~ 58HRC (Depth 1mm)

**S** Black oxide ( $\text{Fe}_3\text{O}_4$ )

②③ **M** SK4

**H** 56 ~ 60HRC

④ Hexagon socket head cap screw  
(with loosening prevention treatment)

| Catalog No. |      | D <sub>H6</sub> | A  | B  | C  | E  | F  | G  | H  | J  | L    | R    | D <sub>1</sub> | d  | d <sub>1</sub> | t  | d <sub>2</sub> | M | d <sub>3</sub> | <div><div></div><div>A</div></div>                                                 |    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------|------|-----------------|----|----|----|----|----|----|----|----|------|------|----------------|----|----------------|----|----------------|---|----------------|------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Type        | D    |                 |    |    |    |    |    |    |    |    |      |      |                |    |                |    |                |   |                |                                                                                    |    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| (For punch) | (10) | +0.009<br>0     | 37 | 20 | 21 | 35 | 20 | 10 | 9  | 29 | 44.5 | 9.5  | 16             | 14 | 9              | 10 | 6              | 4 | —              | <div><div>④M8—40</div><div>⑤MSTM6—30</div><div>⑥MSW8</div><div>⑦MS6—20</div></div> |    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| ①②④⑤⑥⑦      | 13   | +0.011<br>0     | 43 | 26 | 23 | 38 |    | 13 | 11 | 32 | 50   | 12   | 19             |    |                |    |                |   | 17             | 11                                                                                 | 12 | 6.2                                                                                 | <div><div>④M10—40</div><div>⑤MSTM6—30</div><div>⑥MSW8</div><div>⑦MS6—20</div></div> |                                                                                     |                                                                                     |
| ①②          | 16   | +0.013<br>0     | 44 | 24 | 26 | 40 |    |    | 16 | 12 | 34   | 54   | 14             | 22 | 19             | 13 |                |   |                |                                                                                    |    | 14                                                                                  | 9                                                                                   | <div><div>④M12—40</div><div>⑤MSTM6—30</div><div>⑥MSW8</div><div>⑦MS6—20</div></div> |                                                                                     |
| (For die)   | 20   | +0.016<br>0     | 48 | 28 | 27 | 42 |    | 21 |    | 14 | 36   | 59   | 17             | 26 |                |    |                |   | 19             | 13                                                                                 | 14 |                                                                                     | —                                                                                   | 12                                                                                  | <div><div>④M12—40</div><div>⑤MSTM6—30</div><div>⑥MSW8</div><div>⑦MS6—20</div></div> |
| ①③④⑤⑥⑦      | 25   | +0.016<br>0     | 50 | 30 | 30 | 46 |    |    | 23 | 17 | 39   | 65.5 | 19.5           | 31 | 27             | 17 |                |   |                |                                                                                    |    | <div><div>④M12—40</div><div>⑤MSTM6—30</div><div>⑥MSW8</div><div>⑦MS6—20</div></div> |                                                                                     |                                                                                     |                                                                                     |
| ①③          | 32   | +0.016<br>0     | 54 |    | 33 | 48 |    |    |    | 23 | 20   | 42   | 71             | 23 |                | 38 |                |   |                |                                                                                    |    | 27                                                                                  |                                                                                     | 21                                                                                  | <div><div>④M12—40</div><div>⑤MSTM6—30</div><div>⑥MSW8</div><div>⑦MS6—20</div></div> |
|             | (38) | +0.016<br>0     | 58 |    | 35 | 52 |    |    |    |    | 23   | 23   | 46             | 78 |                | 26 |                |   |                |                                                                                    |    |                                                                                     |                                                                                     | 44                                                                                  | 27                                                                                  |

⚠ D10 can be used for punches only. D38 can be used for dies only.



## Order

**Catalog No.**

CLN—P 16



Days to Ship

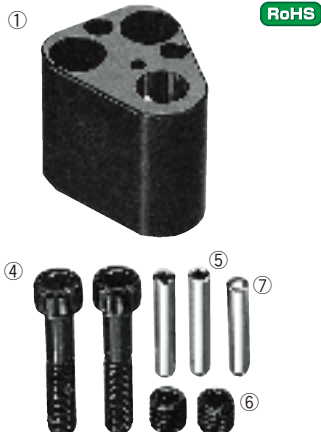
## Quotation

**Price**

## Quotation

—HEAVY LOAD TYPE (COMPACT) —

| Application             | Catalog No.    | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | D       |
|-------------------------|----------------|---|---|---|---|---|---|---|---------|
| For punch               | <b>CBN—P</b>   | ○ | ○ |   |   |   | ○ | ○ | 10 ~ 32 |
|                         | <b>CBN—PN</b>  | ○ |   |   | ○ | ○ | ○ | ○ |         |
| Retainer body<br>+ plug | <b>CBN—PP</b>  | ○ | ○ |   |   |   |   |   |         |
|                         | <b>CBN—PNP</b> | ○ |   | ○ |   |   |   |   |         |



Technical drawing of a hexagonal socket head cap screw with a hexagonal base. The drawing includes a top view, a side view, and two cross-sectional views (2 and 3).

**Top View Dimensions:**

- Overall width:  $L$
- Overall height:  $A$
- Distance from center to top edge:  $F$
- Distance from center to side edge:  $B$
- Distance from center to bottom edge:  $R10$
- Distance from center to left edge:  $R$
- Distance from center to right edge:  $M$
- Distance from center to top hole:  $H \pm 0.01$
- Distance from center to side hole:  $C$
- Distance from center to bottom hole:  $J \pm 0.01$
- Distance from center to left hole:  $E$
- Distance from center to right hole:  $G \pm 0.01$

**Side View Dimensions:**

- Overall height:  $d1$
- Distance from top edge to center:  $t$
- Distance from center to bottom edge:  $d$
- Distance from center to top hole:  $\phi H6$
- Distance from center to side hole:  $15$
- Distance from center to bottom hole:  $40$
- Distance from center to left hole:  $10$
- Distance from center to right hole:  $2-M8 \times 1.25$

**Cross-sectional Views (2 and 3):**

- View 2: Shows a cross-section of the base with a central hole of diameter  $6H7$  and a surrounding hole of diameter  $6H7$ . The distance from the center to the top edge is  $2.6 \pm 0.1$ , and the distance from the center to the side edge is  $6.0 \pm 0.1$ . The distance from the center to the bottom edge is  $6.0 \pm 0.1$ . The distance from the center to the left edge is  $6.0 \pm 0.1$ . The distance from the center to the right edge is  $6.0 \pm 0.1$ . The distance from the center to the top hole is  $2.6 \pm 0.1$ , and the distance from the center to the side hole is  $6.0 \pm 0.1$ . The distance from the center to the bottom hole is  $6.0 \pm 0.1$ , and the distance from the center to the left hole is  $6.0 \pm 0.1$ . The distance from the center to the right hole is  $6.0 \pm 0.1$ .
- View 3: Shows a cross-section of the base with a central hole of diameter  $6H7$  and a surrounding hole of diameter  $6H7$ . The distance from the center to the top edge is  $2.6 \pm 0.1$ , and the distance from the center to the side edge is  $6.0 \pm 0.1$ . The distance from the center to the bottom edge is  $6.0 \pm 0.1$ . The distance from the center to the left edge is  $6.0 \pm 0.1$ . The distance from the center to the right edge is  $6.0 \pm 0.1$ . The distance from the center to the top hole is  $2.6 \pm 0.1$ , and the distance from the center to the side hole is  $6.0 \pm 0.1$ . The distance from the center to the bottom hole is  $6.0 \pm 0.1$ , and the distance from the center to the left hole is  $6.0 \pm 0.1$ . The distance from the center to the right hole is  $6.0 \pm 0.1$ .

**Legend:**

- ① **M** SNCM220
- H** 55 ~ 58HRC (Depth 1m)
- S** Black oxide (FeS<sub>04</sub>)
- ②③ **M** SK4
- H** 56 ~ 60HRC
- ④ Hexagon socket head cap screw (with loosening prevention)

| Catalog No. |    | D <sub>H6</sub> | A  | B  | C  | E  | F  | G  | H  | J  | L    | R    | D <sub>1</sub> | d  | d <sub>1</sub> | t  | d <sub>2</sub> | M | A                                           |    |    |                                              |      |    |    |    |    |                                              |                                              |    |    |    |    |    |                                              |
|-------------|----|-----------------|----|----|----|----|----|----|----|----|------|------|----------------|----|----------------|----|----------------|---|---------------------------------------------|----|----|----------------------------------------------|------|----|----|----|----|----------------------------------------------|----------------------------------------------|----|----|----|----|----|----------------------------------------------|
| Type        | D  |                 |    |    |    |    |    |    |    |    |      |      |                |    |                |    |                |   |                                             |    |    |                                              |      |    |    |    |    |                                              |                                              |    |    |    |    |    |                                              |
| (For punch) | 10 | +0.009<br>0     | 37 | 20 | 21 | 35 | 20 | 10 | 9  | 29 | 44.5 | 9.5  | 16             | 14 | 9              | 10 | 6              | 4 | ④ M8—45<br>⑤ MSTM6—30<br>⑥ MSW8<br>⑦ MS6—20 |    |    |                                              |      |    |    |    |    |                                              |                                              |    |    |    |    |    |                                              |
| ①②④⑤⑥⑦      | 13 | +0.011<br>0     | 43 | 26 | 23 | 38 |    | 13 | 11 | 32 | 50   | 12   | 19             |    |                |    |                |   | 17                                          | 11 | 12 | ④ M10—50<br>⑤ MSTM6—30<br>⑥ MSW8<br>⑦ MS6—20 |      |    |    |    |    |                                              |                                              |    |    |    |    |    |                                              |
| ①②          | 16 |                 | 44 | 24 | 26 | 40 |    |    | 12 | 34 | 54   | 14   | 22             | 18 | 17             | 39 |                |   |                                             |    |    | 65.5                                         | 19.5 | 31 | 19 | 13 | 14 | ④ M12—50<br>⑤ MSTM6—30<br>⑥ MSW8<br>⑦ MS6—20 |                                              |    |    |    |    |    |                                              |
| ①③④⑤⑥⑦      | 20 | +0.013<br>0     | 48 | 28 | 27 | 42 |    | 16 | 14 | 36 | 59   | 17   | 26             |    |                |    |                |   | 21                                          | 20 | 42 |                                              |      |    |    |    |    |                                              | 71                                           | 23 | 38 | 19 | 13 | 14 | ④ M12—50<br>⑤ MSTM6—30<br>⑥ MSW8<br>⑦ MS6—20 |
| ①③          | 25 |                 | 50 | 30 | 30 | 46 |    | 18 | 17 | 39 | 65.5 | 19.5 | 31             |    |                |    |                |   |                                             |    |    |                                              |      |    |    |    |    |                                              |                                              |    |    |    |    |    |                                              |
|             | 32 | +0.016<br>0     | 54 |    | 33 | 48 |    | 21 | 20 | 42 | 71   | 23   | 38             |    |                |    |                |   | 19                                          | 13 | 14 |                                              |      |    |    |    |    |                                              | ④ M12—50<br>⑤ MSTM6—30<br>⑥ MSW8<br>⑦ MS6—20 |    |    |    |    |    |                                              |



## Order

CBN—P 10



Days to Ship

## Quotation

**Price**

## Quotation



# BALL-LOCK RETAINERS

—LIGHT LOAD TYPE (TRIANGLE)—

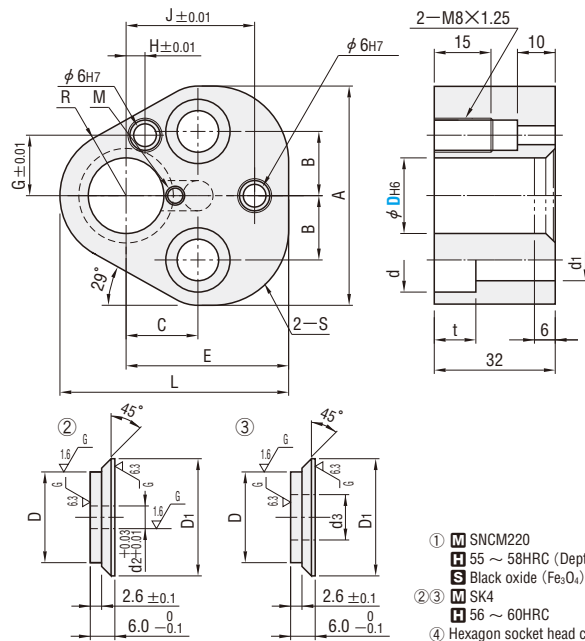
☞ Refer to Notes on P.646.

| Application                  | Catalog No. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | D       |
|------------------------------|-------------|---|---|---|---|---|---|---|---------|
| For punch                    | CRN—P       | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 10 ~ 32 |
| For die                      | CRN—D       | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 13 ~ 38 |
| Retainer body for punch+plug | CRN—PP      | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 10 ~ 32 |
| Retainer body for die+plug   | CRN—DN      | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 13 ~ 38 |

RoHS



☞ Use these retainers for light-load type punches. They cannot be used for heavy load type punches.



- ① M SNCM220  
H 55 ~ 58HRC (Depth 1mm)  
S Black oxide (Fe<sub>3</sub>O<sub>4</sub>)  
②③ M SK4  
H 56 ~ 60HRC  
④ Hexagon socket head cap screw  
(with loosening prevention treatment)

| Catalog No.                              |      | D <sub>H6</sub> | A    | B     | C     | E    | G    | H    | J      | L    | R    | S    | D <sub>1</sub> | d  | d <sub>1</sub> | t  | d <sub>2</sub> | d <sub>3</sub> | M | A                                            |
|------------------------------------------|------|-----------------|------|-------|-------|------|------|------|--------|------|------|------|----------------|----|----------------|----|----------------|----------------|---|----------------------------------------------|
| Type                                     | D    |                 |      |       |       |      |      |      |        |      |      |      |                |    |                |    |                |                |   |                                              |
| (For punch)<br>①②④⑤⑥⑦<br>CRN—P<br>CRN—PP | (10) | +0.009<br>0     | 43.7 | 11.12 | 19.05 | 35.0 | 9.0  | 7.5  | 26.925 | 44.5 | 9.5  | 12.0 | 16             | 14 | 9              | 9  | 6              | —              | 4 | ④ M8—40<br>⑤ MSTM6—30<br>⑥ MSW8<br>⑦ MS6—20  |
|                                          | 13   | +0.011<br>0     | 50.0 | 14.27 |       | 38.1 | 12.0 | 6.5  | 29.970 | 50.8 | 12.7 | 15.2 | 19             |    |                |    |                |                |   |                                              |
|                                          | 16   | +0.011<br>0     | 53.2 | 15.87 |       | 39.7 | 13.5 | 6.0  | 31.750 | 54.0 | 14.3 | 16.8 | 22             |    |                |    |                |                |   |                                              |
|                                          | 20   | +0.013<br>0     | 59.5 | 17.47 |       | 42.8 | 16.5 | 5.0  | 33.530 | 60.3 | 17.5 | 20.0 | 26             |    |                |    |                |                |   |                                              |
| (For die)<br>①③④⑤⑥⑦<br>CRN—D<br>CRN—DN   | 25   | +0.013<br>0     | 69.1 | 19.84 | 23.82 | 47.7 | 22.0 | 7.0  | 40.640 | 69.9 | 22.2 | 24.7 | 31             | 19 | 13             | 14 | —              | 12             | 4 | ④ M10—40<br>⑤ MSTM6—30<br>⑥ MSW8<br>⑦ MS6—20 |
|                                          | 32   | +0.016<br>0     | 76.6 | 24.00 | 27.00 | 51.4 | 26.0 | 10.0 | 43.993 | 77.4 | 26.0 | 28.5 | 38             |    |                |    |                |                |   |                                              |
|                                          | (38) | +0.016<br>0     | 76.6 | 24.00 | 27.00 | 51.4 | 26.0 | 10.0 | 43.993 | 77.4 | 26.0 | 28.5 | 44             |    |                |    |                |                |   |                                              |
|                                          |      |                 |      |       |       |      |      |      |        |      |      |      |                |    |                |    |                |                |   |                                              |

☞ D10 can be used for punches only. D38 can be used for dies only.



Order

Catalog No.

CRN—P 16



Days to Ship

Quotation



Price

Quotation

# BALL-LOCK RETAINERS

—HEAVY LOAD TYPE (TRIANGLE)—

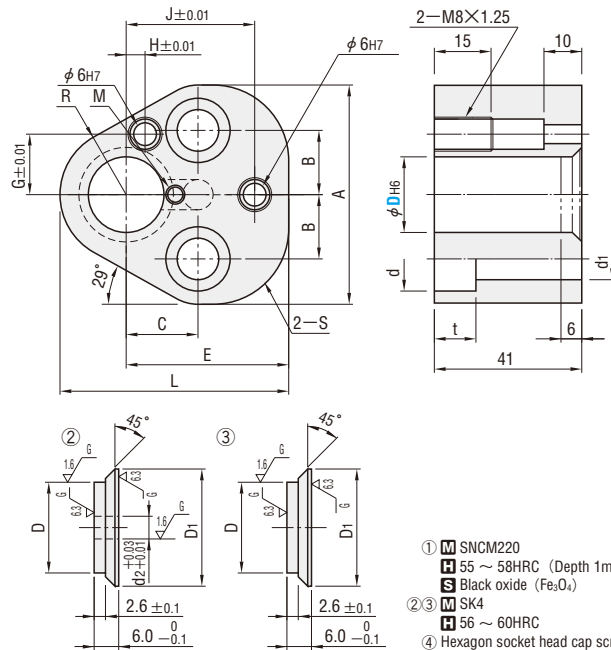
Refer to Notes on P.646.

| Application          | Catalog No. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | D       |
|----------------------|-------------|---|---|---|---|---|---|---|---------|
| For punch            | BRN—P       | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 10 ~ 32 |
|                      | BRN—PN      | ○ | ○ | ○ | ○ | ○ | ○ | ○ |         |
| Retainer body + plug | BRN—PP      | ○ | ○ | ○ | ○ | ○ | ○ | ○ |         |
|                      | BRN—PNP     | ○ | ○ | ○ | ○ | ○ | ○ | ○ |         |

RoHS



Use these retainers for heavy-load type punches. They cannot be used for light load type punches.



- ① M SNCM220
- H 55 ~ 58HRC (Depth 1mm)
- S Black oxide (Fe<sub>3</sub>O<sub>4</sub>)
- ②③ M SK4
- H 56 ~ 60HRC
- ④ Hexagon socket head cap screw (with loosening prevention treatment)

| Catalog No.           |         | D  | D <sub>H6</sub> | A    | B     | C     | E    | G    | H   | J      | L    | R    | S    | D <sub>1</sub> | d  | d <sub>1</sub> | t  | d <sub>2</sub> | M | A                                           |
|-----------------------|---------|----|-----------------|------|-------|-------|------|------|-----|--------|------|------|------|----------------|----|----------------|----|----------------|---|---------------------------------------------|
| Type                  |         |    |                 |      |       |       |      |      |     |        |      |      |      |                |    |                |    |                |   |                                             |
| (For punch)<br>①②④⑤⑥⑦ | BRN—P   | 10 | +0.009<br>0     | 43.7 | 11.12 | 19.05 | 35.0 | 9.0  | 7.5 | 26.925 | 44.5 | 9.5  | 12.0 | 16             |    |                |    |                |   | ④ M8—45<br>⑤ MSTM6—30<br>⑥ MSW8<br>⑦ MS6—20 |
|                       | BRN—PP  | 13 | +0.011<br>0     | 50.0 | 14.27 |       | 38.1 | 12.0 | 6.5 | 29.970 | 50.8 | 12.7 | 15.2 | 19             | 14 | 9              | 9  |                |   |                                             |
|                       |         | 16 |                 | 53.2 | 15.87 |       | 39.7 | 13.5 | 6.0 | 31.750 | 54.0 | 14.3 | 16.8 | 22             |    |                |    |                |   |                                             |
| ①③④⑤⑥⑦                | BRN—PN  | 20 | +0.013<br>0     | 59.5 | 17.47 | 23.82 | 42.8 | 16.5 | 5.0 | 33.530 | 60.3 | 17.5 | 20.0 | 26             | 17 | 11             | 11 |                |   | ④ M10—50 ⑥ MSW8<br>⑤ MSTM6—30 ⑦ MS6—20      |
|                       | BRN—PNP | 25 |                 | 69.1 | 19.84 |       |      |      |     |        |      |      |      | 31             |    |                |    |                |   |                                             |
|                       |         | 32 | +0.016<br>0     |      |       |       | 47.7 | 22.0 | 7.0 | 40.640 | 69.9 | 22.2 | 24.7 | 38             | 19 | 13             | 14 |                |   |                                             |



Order

Catalog No.

BRN—P 20



Days to Ship

Quotation



Price

Quotation

—LIGHT LOAD TYPE (TRIANGLE COMPACT)—

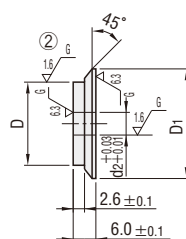
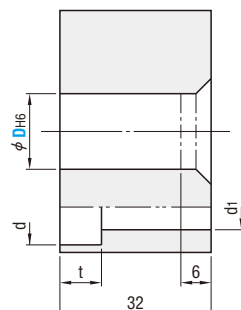
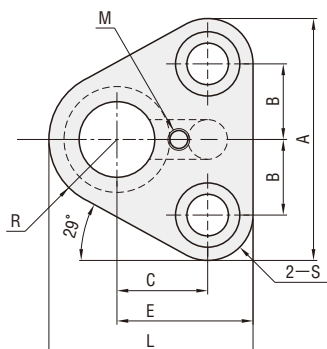
 This product will be discontinued beginning from the next catalog.

Refer to Notes on P.646.

| Application             | Catalog No. | ① | ② | ③ | ④ | D     |
|-------------------------|-------------|---|---|---|---|-------|
| For punch               | CCRN        | ○ | ○ | ○ | ○ | 10~25 |
| Retainer body<br>+ plug | CCRN-N      | ○ | ○ |   |   |       |

RoHS

⚠ Use these retainers for light-load type punches. They cannot be used for heavy load type punches.



- ① **M** SNCM220  
**H** 55 ~ 58HRC (Depth 1mm)  
**S** Black oxide (Fe<sub>3</sub>O<sub>4</sub>)
- ② **M** SK4  
**H** 56 ~ 60HRC
- ③ Hexagon socket head cap screw  
(with loosening prevention treatment)

| Catalog No.                                   |    | D <sub>H6</sub> | A    | B     | C     | E  | L    | R    | S  | D <sub>1</sub> | d  | d <sub>1</sub> | t  | d <sub>2</sub> | M | A                  |                    |
|-----------------------------------------------|----|-----------------|------|-------|-------|----|------|------|----|----------------|----|----------------|----|----------------|---|--------------------|--------------------|
| Type                                          | D  |                 |      |       |       |    |      |      |    |                |    |                |    |                |   |                    |                    |
| (For punch)<br><br>①②③④ CCRN<br><br>①② CCRN—N | 10 | +0.009<br>0     | 41.2 | 11.12 | 19.05 | 29 | 38.5 | 9.5  | 10 | 16             | 14 | 9              | 9  | 6              | 4 | ③M 8—40<br>④MS6—20 |                    |
|                                               | 13 | +0.011<br>0     | 47.5 | 14.27 |       |    | 41.7 | 12.7 |    | 19             |    |                |    |                |   |                    |                    |
|                                               | 16 |                 | 50.7 | 15.87 |       |    | 43.3 | 14.3 |    | 22             |    |                |    |                |   |                    |                    |
|                                               | 20 | +0.013<br>0     | 56.9 | 17.47 | 23.82 | 37 | 47.5 | 17.5 | 11 | 26             | 17 | 11             | 11 |                |   |                    | ③M10—40<br>④MS6—20 |
|                                               | 25 |                 | 69.1 | 19.84 |       |    | 59.2 | 22.2 | 15 | 31             | 19 | 13             | 14 |                |   |                    | ③M12—40<br>④MS6—20 |



## Order

**Catalog No.**

CCRN 16



Days to Ship

## Quotation

**Price**

## Quotation

# BALL-LOCK RETAINERS

— LIGHT LOAD • SPACE SAVING • SINGLE FIXING-BOLT TYPE —

Refer to Notes on P.646.

For round punch



RoHS

| Application          | Catalog No.   | Components |   |   |   |   |   |   |
|----------------------|---------------|------------|---|---|---|---|---|---|
|                      |               | ①          | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| For round punch      | <b>CLN—PS</b> | ○          | ○ | ○ | ○ | ○ | ○ | ○ |
| Retainer body + plug | <b>CLN—PN</b> | ○          | ○ | ○ | ○ | ○ | ○ | ○ |

⑤ MSTM and ⑥ MSW are not included with retainers for round punches.

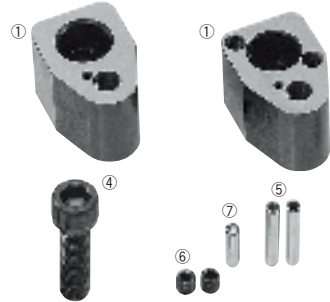
For shaped punch and button die



| Application                           | Catalog No.    | Components |   |   |   |   |   |   |
|---------------------------------------|----------------|------------|---|---|---|---|---|---|
|                                       |                | ①          | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| For shaped punch                      | <b>CLN—FS</b>  | ○          | ○ | ○ | ○ | ○ | ○ | ○ |
| For button die                        | <b>CLN—DS</b>  | ○          | ○ | ○ | ○ | ○ | ○ | ○ |
| Retainer body for shaped punch + plug | <b>CLN—FSN</b> | ○          | ○ | ○ | ○ | ○ | ○ | ○ |
| Retainer body for button die + plug   | <b>CLN—DSN</b> | ○          | ○ | ○ | ○ | ○ | ○ | ○ |

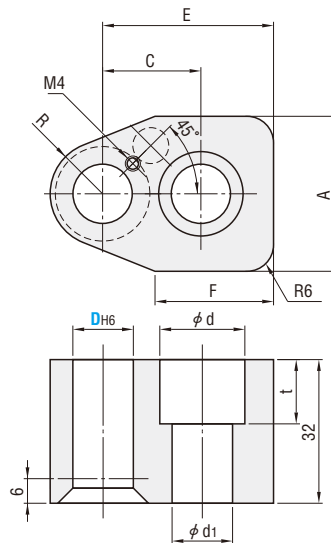
Only D13~D16 are available for button dies.

For round punch For shaped punch and button die

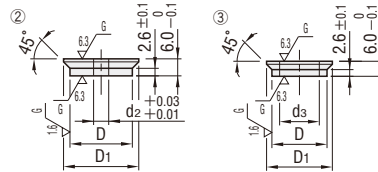
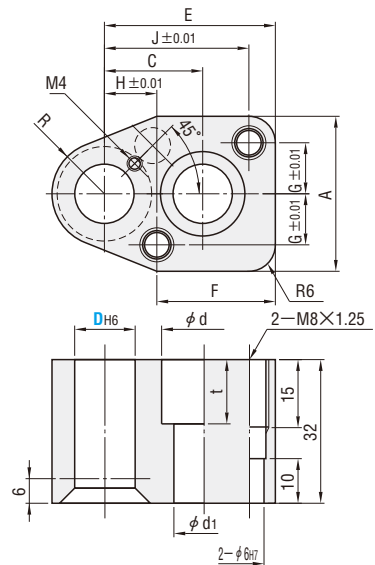


Use these retainers for light-load type punches. They cannot be used for heavy load type punches.

— For round punch —



— For shaped punch and button die —



- ① M SNCM220
- ② H 55~58HRC (Depth 1mm)
- ③ S Black oxide (Fe3O4)
- ④ M SK4
- ⑤ H 56~60HRC
- ⑥ Hexagon socket head cap screw (with loosening prevention treatment)

| Catalog No.                                                                                                 |   | D <sub>H6</sub> | A           | C  | E  | F  | G  | H  | J  | R  | D <sub>1</sub> | d  | d <sub>1</sub> | t  | d <sub>2</sub> | d <sub>3</sub> | For round punch    | For shaped punch                         |
|-------------------------------------------------------------------------------------------------------------|---|-----------------|-------------|----|----|----|----|----|----|----|----------------|----|----------------|----|----------------|----------------|--------------------|------------------------------------------|
| Type                                                                                                        | D |                 |             |    |    |    |    |    |    |    |                |    |                |    |                |                | A ④ ⑦              | A ④⑤⑥⑦                                   |
| (For round punch)<br>①②④⑦<br>①②<br>CLN—PS<br>CLN—PN                                                         |   | (10)            | +0.009<br>0 |    |    |    |    |    |    |    | 16             |    |                |    |                | —              | ④M12—40<br>⑦MS6—20 | ④M12—40<br>⑤MSTM6—30<br>⑥MSW8<br>⑦MS6—20 |
|                                                                                                             |   | 13              |             | 34 | 22 | 38 | 26 | 11 | 12 | 32 | 11.5           | 19 | 13             | 14 | 6              | 6.2            |                    |                                          |
| (For shaped punch and button die)<br>①②④⑤⑥⑦<br>①③④⑤⑥⑦<br>①②<br>①③<br>CLN—FS<br>CLN—DS<br>CLN—FSN<br>CLN—DSN |   | 16              | +0.011<br>0 |    |    |    |    |    |    |    |                |    |                |    |                | 9              | ④M16—40<br>⑦MS6—20 | ④M16—40<br>⑤MSTM6—30<br>⑥MSW8<br>⑦MS6—20 |

D10 is available only for punch retainers.



Order

Catalog No.

CLN—PS 10



Days to Ship

Quotation



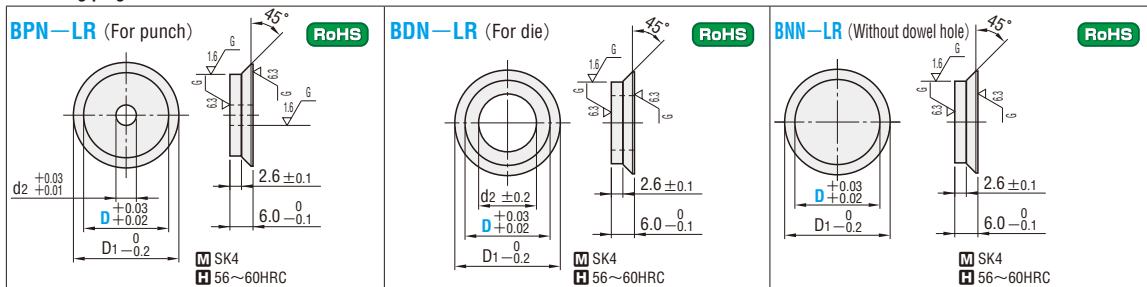
Price

Quotation

# BALL-LOCK RETAINERS

## —COMPONENTS—

### ■Backing plugs for ball-lock



| Retainer                                                                             | D1                               | d2                               | Catalog No.<br>Type | D                                | Base unit price<br>1~4 pieces | Volume discount unit price<br>5~9 pieces 10~19 pieces 20~50 pieces |
|--------------------------------------------------------------------------------------|----------------------------------|----------------------------------|---------------------|----------------------------------|-------------------------------|--------------------------------------------------------------------|
| CRN—P<br>BRN—P<br>CLN—P<br>CBN—P<br>CCRN<br>CLN—PS<br>CLN—FS<br>LRGD—L/R<br>BRGD—L/R | 16<br>19<br>22<br>26<br>31<br>38 | 6                                | BPN—LR              | 10<br>13<br>16<br>20<br>25<br>32 |                               |                                                                    |
| CRN—D<br>CLN—D                                                                       | 19<br>22<br>26<br>31<br>38<br>44 | 6.2<br>9<br>12<br>17<br>21<br>27 | BDN—LR              | 13<br>16<br>20<br>25<br>32<br>38 | Quotation                     |                                                                    |
| BRN—P<br>CBN—PN                                                                      | 16<br>19<br>22<br>26<br>31<br>38 | —                                | BNN—BR              | 10<br>13<br>16<br>20<br>25<br>32 |                               |                                                                    |

### ■Balls for ball-lock retainers

| Retainer                               | D           | Catalog No.    | Base unit price<br>1~4 pieces | Volume discount unit price<br>5~9 pieces 10~19 pieces 20~50 pieces |
|----------------------------------------|-------------|----------------|-------------------------------|--------------------------------------------------------------------|
| Light load<br>CLN—P<br>CLN—PS<br>CLN—D | 10~38       | BB 8           |                               |                                                                    |
| Heavy load<br>CBN—P<br>CBN—PN          | 10<br>13~32 | BB 10<br>BB 13 | Quotation                     |                                                                    |

### ■Springs for ball-lock retainers

| Retainer                               | D           | Catalog No.    | Base unit price<br>1~4 pieces | Volume discount unit price<br>5~9 pieces 10~19 pieces 20~50 pieces |
|----------------------------------------|-------------|----------------|-------------------------------|--------------------------------------------------------------------|
| Light load<br>CLN—P<br>CLN—PS<br>CLN—D | 10~38       | BF 8           |                               |                                                                    |
| Heavy load<br>CBN—P<br>CBN—PN          | 10<br>13~32 | BF 10<br>BF 13 | Quotation                     |                                                                    |



Order

Catalog No.

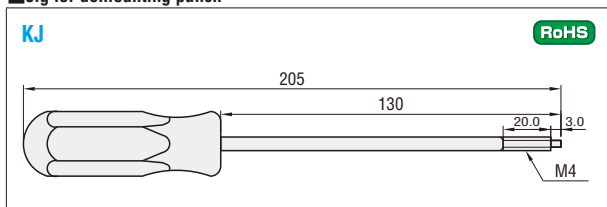
BPN—LR25



Days to Ship

Quotation

### ■Jig for demounting punch



Order

Catalog No.

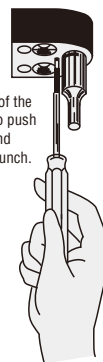
KJ



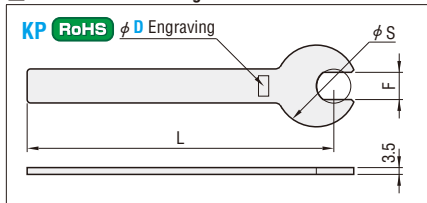
Days to Ship

Quotation

●Screw in the threaded tip of the jig in order to push up the ball and release the punch.



### ■Wrenches for checking lock

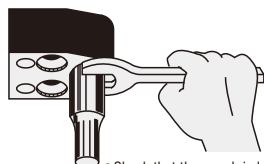


| D  | F  | S  | L   | Catalog No.<br>Type | D  | Base unit price<br>1~4 pieces | Volume discount unit price<br>5~9 pieces 10~19 pieces 20~50 pieces |
|----|----|----|-----|---------------------|----|-------------------------------|--------------------------------------------------------------------|
| 10 | 8  | 20 | 83  | KP                  | 10 |                               |                                                                    |
| 13 | 10 | 25 | 84  |                     | 13 |                               |                                                                    |
| 16 | 13 | 30 | 85  |                     | 16 |                               |                                                                    |
| 20 | 17 | 36 | 105 |                     | 20 |                               |                                                                    |
| 25 | 22 | 45 | 106 |                     | 25 |                               |                                                                    |
| 32 | 29 | 52 | 125 |                     | 32 |                               |                                                                    |
| 38 | 35 | 58 | 124 |                     | 38 |                               |                                                                    |

Quotation



Example



●Check that the punch is locked by the ball-lock in the correct position by placing a wrench into the punch groove and turning it in both directions.



Order

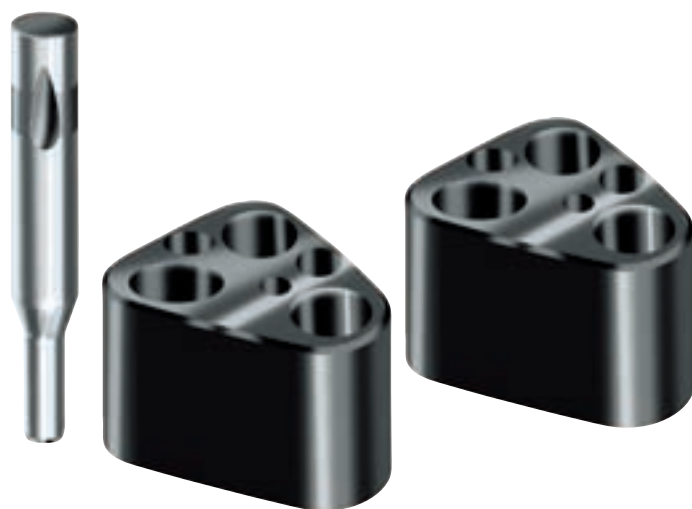
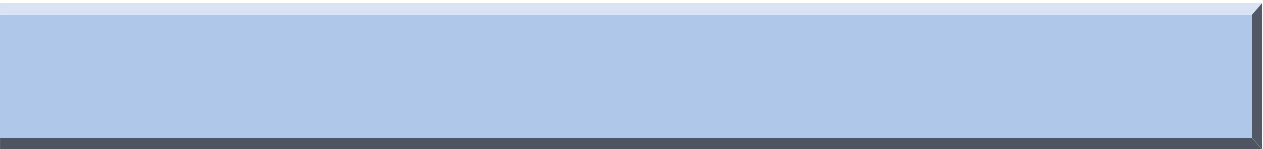
Catalog No.

KP 32

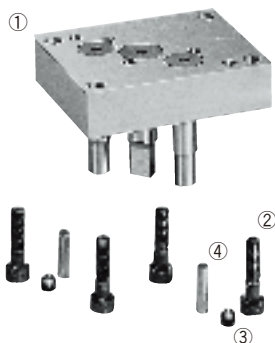


Days to Ship

Quotation



—FOR BALL-LOCK PUNCHES—



RoHS

| Backing plug             |                        |
|--------------------------|------------------------|
| Type A                   | Type B                 |
| <p>⑤ With dowel hole</p> | <p>⑥ No dowel hole</p> |

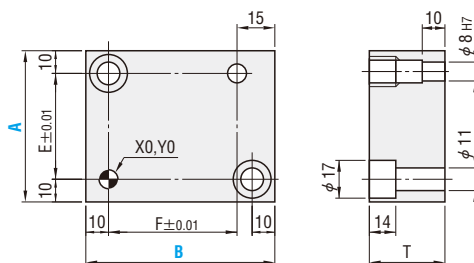
- The type A backing plug is the default type.
  - To select type B, add the letter "B" after the code for the punch type.  
(ex. LRGD—L80100—RB13...)
- Backing plugs  **P.665**

- Backing plugs  P.665

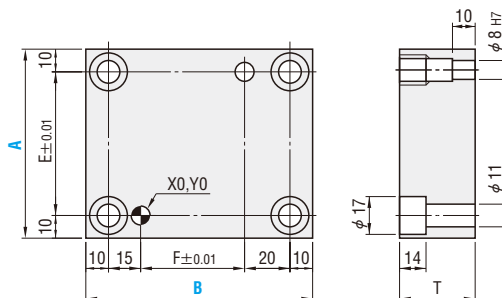
- ① **M** SNCM220  
**H** 55 ~ 58HRC Depth 1mm  
 ② Hexagon socket head cap screw  
 (with loosening prevention treatment)  
 ⑤⑥ **M** SK4  
**H** 56 ~ 60HRC

### Standard dimensions of retainer plate

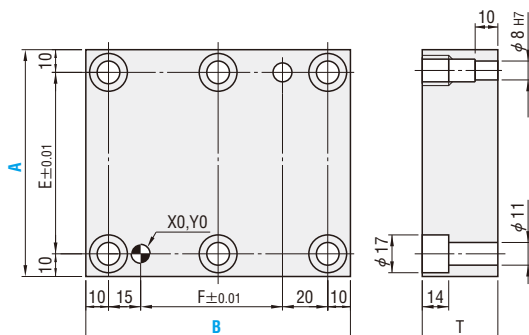
| A  | B   | E  | F  | T    | A                                                   |
|----|-----|----|----|------|-----------------------------------------------------|
| 50 | 60  | 30 | 35 | LRGD | ②M10—40 2 pcs.<br>③MSW10 2 pcs.<br>④MSTM8×30 2 pcs. |
|    | 80  |    | 55 | 32   |                                                     |
| 60 | 80  | 40 | 55 | BRGD |                                                     |
|    | 100 |    | 75 | 40   |                                                     |

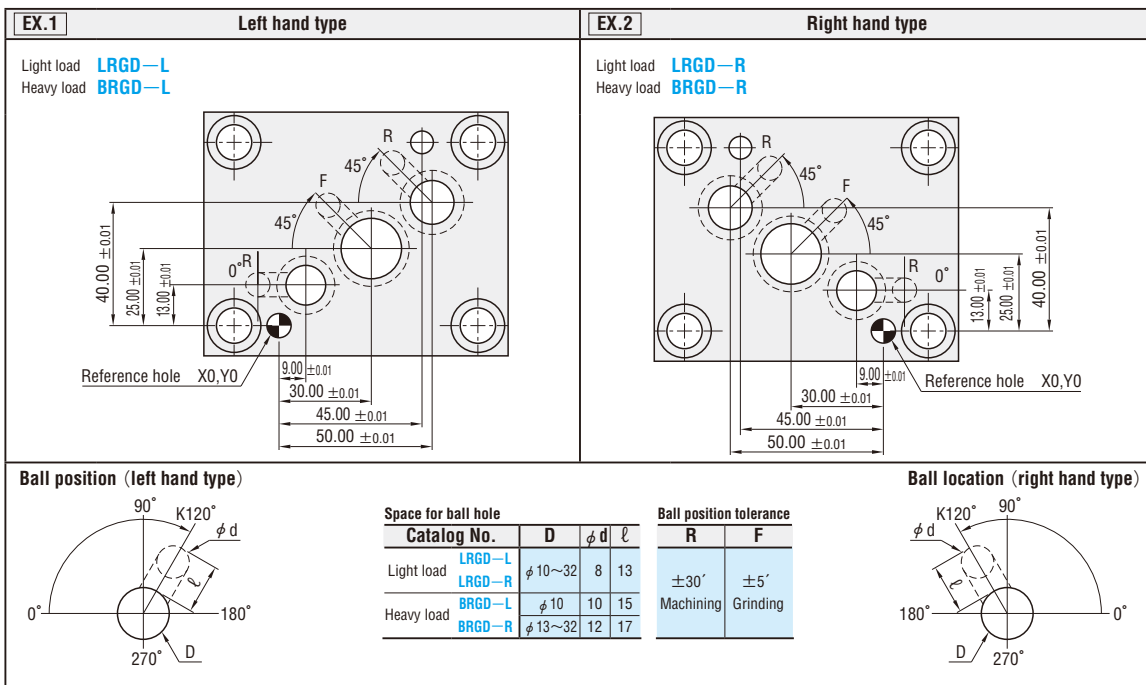


| A   | B   | E  | F  | T          | A                                                   |
|-----|-----|----|----|------------|-----------------------------------------------------|
| 80  | 80  | 60 | 25 | LRGD<br>32 | ②M10—40 4 pcs.<br>③MSW10 2 pcs.<br>④MSTM8×30 2 pcs. |
|     | 100 |    | 45 |            |                                                     |
|     | 125 |    | 70 |            |                                                     |
| 100 | 100 | 80 | 45 | BRGD<br>40 |                                                     |
|     | 125 |    | 70 |            |                                                     |
|     | 150 |    | 95 |            |                                                     |



| A   | B   | E   | F   | T     | A                                                   |
|-----|-----|-----|-----|-------|-----------------------------------------------------|
| 125 | 150 | 105 | 95  | LARGD | ②M10—40 6 pcs.<br>③MSW10 2 pcs.<br>④MSTM8×30 2 pcs. |
|     | 175 |     | 120 | 32    |                                                     |
| 150 | 175 | 130 | 120 | BRGD  |                                                     |
|     | 200 |     | 145 | 40    |                                                     |





Order

- (1) Selection of left-hand type or right-hand type
- (2) Selection of the standard retainer plate from the detail specifications on the page at left
- (3) Selection of punch type (round or shaped), backing plug (type A or type B), and punch diameter
  - Type A backing plug < For round punch—Put "D" after code "R".  
For shaped punch—Put "D" after code "F".
  - Type B backing plug < For round punch—Put "D" after code "RB".  
For shaped punch—Put "D" after code "FB".
- (4) Specify the punch hole position.  $X \pm 0.01$   $Y \pm 0.01$   
X and Y are indicated in units of 0.01mm from the center of the reference hole.  
⚠ Punch holes must be separated from each other and from the dowel holes and bolt holes by a minimum of 2 mm in order to prevent interference.
- (5) Selection of the ball position  
Selection of angle K in 1° increments

|                 | (1)<br>Plate Type   | (2)<br>A B    | (3)<br>R (B) • F (B) • D | (4)<br>X — Y — K               | (5)<br>K |
|-----------------|---------------------|---------------|--------------------------|--------------------------------|----------|
| <b>EX.1</b>     | ..... <b>LRGD—L</b> | <b>80 100</b> | — <b>R13</b>             | — <b>X 9.00 — Y13.00 — K 0</b> |          |
| Left hand type  |                     |               | — <b>F20</b>             | — <b>X30.00 — Y25.00 — K45</b> |          |
|                 |                     |               | — <b>R16</b>             | — <b>X50.00 — Y40.00 — K45</b> |          |
| <b>EX.2</b>     | ..... <b>BRGD—R</b> | <b>80 100</b> | — <b>RB13</b>            | — <b>X 9.00 — Y13.00 — K 0</b> |          |
| Right hand type |                     |               | — <b>FB20</b>            | — <b>X30.00 — Y25.00 — K45</b> |          |
|                 |                     |               | — <b>RB16</b>            | — <b>X50.00 — Y40.00 — K45</b> |          |



Days to Ship

**Quotation**



Price

**Quotation**