

BALL-LOCK PUNCHES

— LIGHT LOAD TYPE (ECONOMY) —

Shank type **Catalog No.** **Type** **Tip shape** **Tip length** **B** The tip shape can be selected from Tip shape A ~ G in the figure below.

Equivalent to SKD11 60 ~ 63HRC **ELP**

Tip shape A **Tip shape D** **Tip shape R** **Tip shape E** **Tip shape G**

$L \begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$ $B \begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$ $R10$ R G $P \pm 0.01$ $W \pm 0.01$ D_{g5} A $\phi 0.01 A$

$P \geq W$
 $R=0$ can be selected.
 $K = \sqrt{P^2 + W^2}$

$P \geq W$
 $0.15 \leq R < \frac{W}{2}$
 $K = \sqrt{(P-2R)^2 + (W-2R)^2 + 2R}$

$P \geq W$
 $R=0$ can be selected.
 $K = \sqrt{P^2 + W^2}$

$P \geq W$
 $0.15 \leq R < \frac{W}{2}$
 $K = \sqrt{(P-2R)^2 + (W-2R)^2 + 2R}$

$P \geq W$
 $R=0$ can be selected.
 $K = \sqrt{P^2 + W^2}$

$P \geq W$
 $0.15 \leq R < \frac{W}{2}$
 $K = \sqrt{(P-2R)^2 + (W-2R)^2 + 2R}$

Catalog No.	Type	D	L	0.01mm increments				B
				A	D	R	E	
				min. P max.	P-Kmax.	P-Wmin.	R	
S	ELPAS	10	63 71 74 80 90	3.00 ~ 9.97	9.90	2.50		13
A	ELPDS	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	ELPRS	25		18.00 ~ 24.97	24.90	6.00		
G	ELPGS	32	22.00 ~ 31.97	31.90	7.00			
L	ELPAL	10	71 74 80 90	3.00 ~ 9.97	9.90	2.50		19
A	ELPDL	13		6.00 ~ 12.97	12.90	3.00		
D	ELPDL	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			

P Price **Quotation**

Order **Catalog No.** - **L** - **P** - **W** - **R** (R 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	Tip diameter change $PC \geq \frac{P_{min}}{2}$ 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip diameter change $PC \geq \frac{P-W_{min}}{2}$ 0.01mm increments				Quotation
	WC						
	BC	Tip length change $2 \leq BC \leq B_{max}$. 0.1mm increments Full length (L) must be at least 45mm longer than tip length (BC).					
Alterations to full length	PKC	Tip tolerance change $P + 0.01 \rightarrow +0.005$ 0	Tip tolerance change $P-W \pm 0.01 \rightarrow +0.01$ 0				
	SC	Lapping of tip P dimension tolerance and increment are the same. R=0 cannot be selected for the tip shape D corners.					

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

BALL-LOCK PUNCHES

— HEAVY LOAD TYPE (ECONOMY) —

Shank type **Catalog No.** **Type** **Tip shape** **Tip length** **B** The tip shape can be selected from Tip shape A ~ G in the figure below.

Equivalent to SKH51 61 ~ 64HRC **EBP**

Tip shape A **Tip shape D** **Tip shape R** **Tip shape E** **Tip shape G**

$L \begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$ $B \begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$ $R10$ R G $P \pm 0.01$ $W \pm 0.01$ D_{g5} A $\phi 0.01 A$

$P \geq W$
 $R=0$ can be selected.
 $K = \sqrt{P^2 + W^2}$

$P \geq W$
 $0.15 \leq R < \frac{W}{2}$
 $K = \sqrt{(P-2R)^2 + (W-2R)^2 + 2R}$

$P \geq W$
 $R=0$ can be selected.
 $K = \sqrt{P^2 + W^2}$

$P \geq W$
 $0.15 \leq R < \frac{W}{2}$
 $K = \sqrt{(P-2R)^2 + (W-2R)^2 + 2R}$

$P \geq W$
 $R=0$ can be selected.
 $K = \sqrt{P^2 + W^2}$

$P \geq W$
 $0.15 \leq R < \frac{W}{2}$
 $K = \sqrt{(P-2R)^2 + (W-2R)^2 + 2R}$

Catalog No.	Type	D	L	0.01mm increments				B
				A	D	R	E	
				min. P max.	P-Kmax.	P-Wmin.	R	
S	EBPAS	10	71 80 90 100	3.00 ~ 9.97	9.90	2.50		13
A	EBPDS	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	EBPRS	25		18.00 ~ 24.97	24.90	6.00		
G	EBPGS	32	22.00 ~ 31.97	31.90	7.00			
L	EBPAL	10	80 90 100	3.00 ~ 9.97	9.90	2.50		19
A	EBPDL	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			

P 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	Tip diameter change $PC \geq \frac{P_{min}}{2}$ 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip diameter change $PC \geq \frac{P-W_{min}}{2}$ 0.01mm increments				Quotation
	WC						
	BC	Tip length change $2 \leq BC \leq B_{max}$. 0.1mm increments Full length (L) must be at least 50mm longer than tip length (BC).					
Alterations to full length	PKC	Tip tolerance change $P + 0.01 \rightarrow +0.005$ 0	Tip tolerance change $P-W \pm 0.01 \rightarrow +0.01$ 0				
	SC	Lapping of tip P dimension tolerance and increment are the same. R=0 cannot be selected for the tip shape D corners.					

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