

# BALL PLUNGERS / WRENCHES

# KNOCKOUT PINS / PUSHING PINS

### Ball plungers — Normal type —

Type	Main body			Ball	SPRINGS	SPACERS	Service temp. range		
	M	H	S						
<b>Metal ball</b>	For light load <b>BPJ</b> For heavy load <b>BSJ</b> For extremely heavy load <b>BPW</b>	SCM435 Equivalent to SUS304 SCM435	29~35HRC	Black oxide	SUSJ2	55HRC~	SWP-B	SUS304	-30~80°C
<b>Resin ball</b>	For light load <b>NBPJ</b> For heavy load <b>NBSJ</b> For extremely heavy load <b>NBPW</b>	S45C	29~35HRC	Black oxide					

Spacer, Loosening prevention treatment (M5 ~ M16)

Load min. max.

⚠ On Standard Type, thread-locking adhesive is not applied on M2, M3 and M4.  
⚠ To fix the position of the ball plunger microencapsulated anaerobic adhesive is applied. Once the parts have been loosened, adhesion is lost, use an anaerobic adhesive when reassembling.  
⚠ The adhesive is most effective if left on the part for 72 hours and more in 25 °C. Note if the parts are left for short period of time and in low temperature, the thread-lock will be less-effective.

RoHS

⚠ Not compatible with catalog Nos. indicated by [ ]

Metal ball	Resin ball	L	ℓ	B	Catalog No.						Base unit price 1~49 pieces			
					For light load (BPJ-NBPJ)		For heavy load (BSJ-NBSJ)		For extremely heavy load (BPW-NBPW)		Type	M (Coarse thread)	Metal ball	Resin ball
					min.	max.	min.	max.	min.	max.				
1	0.2	—	—	5	1	0.9	0.7	1.4	1.2	2	—	—	Quotation	
1.5	0.5	—	—	7	1	1.5	1	2	1.5	2.9	2.2	5		
2.5	—	2.4	—	9	1.5	2	2	4.9	3.9	9.8	2.5	12.5		
3	—	3.2	—	12	2	2.5	2.9	9.8	4.9	19.6	11.2	24.1		
3	—	3.2	0.8	13	2.5	3	4.9	14.7	9.8	29.4	17.7	33.4		
4	1	4	1.0	15	2.5	4	6.9	19.6	12.7	39.2	21.4	45.3		
5	1.2	4.8	1.2	16	3	5	8.8	24.5	18.6	49	23.5	58.7		
7	1.8	7.1	1.8	20	3	6	9.8	29.4	19.6	58.8	24.1	62.3		
9.5	2.5	9.5	2.5	25	3	8	15.7	49	29.4	98	43.6	116		

⚠ M2, M3, M4 do not include a crimping groove on the tip. They can be installed in hexagon holes only.  
⚠ Load min. is the initial load and max. is the load at the time when the ball is sunk furthest.  
(kgf)=N×0.101972

### Ball plungers — Stainless steel normal type —

Type	Main body			Ball	SPRINGS	SPACERS	Service temp. range
	M	H	S				
<b>Metal ball</b>	For light load <b>BSM</b> For heavy load <b>BSZ</b> For extremely heavy load <b>BSX</b>	Equivalent to SUS304	SUS440C	55HRC~	SUS631J1	SUS304	-30~260°C
<b>Resin ball</b>	For light load <b>NBSM</b> For heavy load <b>NBSZ</b> For extremely heavy load <b>NBSX</b>						

Spacer, Load min. max.

RoHS

Metal ball	Resin ball	L	ℓ	B	Catalog No.						Base unit price 1~49 pieces					
					For light load (BSM)		For light load (NBSM)		For heavy load (BSZ-NBSZ)		For extremely heavy load (BSX-NBSX)		Type	M (Coarse thread)	Metal ball	Resin ball
					min.	max.	min.	max.	min.	max.	min.	max.				
1	0.2	—	—	5	1	0.9	0.7	1.4	1.2	2	—	—	Quotation			
1.5	0.5	—	—	7	1	1.5	1	2	1.5	2.9	2.2	5				
2.5	—	2.4	—	9	1.5	2	2	4.9	3.9	9.8	2.5	12.5				
3	—	3.2	0.8	12	2	2.5	2.9	9.8	4.9	19.6	11.2	24.1				
3	—	3.2	—	13	2.5	3	5.1	15.3	4.9	14.7	9.8	29.4				
4	1	4.0	1.0	15	2.5	4	5.5	19.1	6.9	19.6	12.7	39.2				
5	1.2	4.8	1.2	16	3	5	8.9	24.1	8.8	24.5	18.6	49				
7	1.8	7.1	1.8	20	3	6	10.5	29.3	9.8	29.4	19.6	58.8				
9.5	2.5	9.5	2.5	25	3	8	14.9	48.9	15.7	49	29.4	98				

⚠ M2, M3, M4 do not include a crimping groove on the tip. They can be installed in hexagon holes only.  
⚠ Loosening prevention treatment is not applied.  
(kgf)=N×0.101972

Order **Catalog No.** **BPJ16** **BSZ10** Days to Ship **Quotation** Price **Quotation**

### Wrenches for ball plungers

M	Catalog No.	Base unit price 1~9 pieces	Volume discount unit price 10~19 pieces
5-6	<b>BPJG 1</b>		
8	<b>BPJG 2</b>		
10	<b>BPJG 3</b>		
12	<b>BPJG 4</b>		
16	<b>BPJG 5</b>		

⚠ For larger orders, ask about prices/delivery.  
⚠ Can be used for ball plungers (BPJ-BSJ-BSZ-BSX-FBPJ-FBPJS) with M5~M16. Cannot be used with short plungers and resin type ball plungers.

Order **Catalog No.** **BPJG2** Days to Ship **Quotation**

M S45C  
□ 34~43HRC  
■ Black oxide (Fe<sub>3</sub>O<sub>4</sub>)

### Knockout pins

RoHS

**KOP**

Note that the L dimension does not include head thickness (T).

Equivalent to SK4  
53~58HRC

T	H	Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	Base unit price 1~19 pieces
3	6	<b>KOP</b>	4	7.0~60.0	1.00~4.00	Quotation
	8		6		1.00~6.00	
	10		8		2.00~8.00	
5	12		10		3.00~10.00	
	14		12		4.00~12.00	
	16		13		6.00~13.00	

Order **Catalog No.** **L** **P**  
**KOP 6** — **15.5** — **P3.50**

Days to Ship **Quotation**

Price **Quotation**

Alterations **Catalog No.** **L** **P** (HC-TC, etc.)  
**KOP 6** — **45.5** — **P5.50** — **VSC**

Alteration	Code	Spec.	1Code
	<b>HC</b>	Head diameter change P≤HC<H 0.1mm increments	Quotation
	<b>TC</b>	Head thickness change 3.5≤TC<5 0.1mm increments ⚠ Can be used for KOP8~13.	
	<b>RC</b>	Rounding of pin end to R0.2~0.3	
	<b>VSC</b>	Lapping of pin end	
	<b>TRN</b>	Addition of undercut (Plate chamfering is not necessary.)	
	<b>TRC</b>	Change of R under head R0.2~0.5 is changed to 0.6~1.0. ⚠ Can be used for H~P≥3.5.	
	<b>LKC</b>	L dimension tolerance change L±0.1→±0.02	

### Pushing pins

RoHS

**JP**  
**JPW**  
**JPWH**

Catalog No.	L	R
<b>JP</b>	L <sup>+0.3</sup> <sub>0</sub>	R≤0.3
<b>JPW</b> <b>JPWH</b>	L±0.1	0.5≤R≤1.0

**JP-JPW** □ DH2F □ 40HRC~  
**JPWH** □ SKD61 □ 50HRC~

T	H	Catalog No. Type	D	0.1mm increments L	Base unit price 1~49 pieces						
2	3	<b>JP</b>	1	5.0~70.0	L5~29.9	L30.0	L30.1~49.9	L50.0	L50.1~69.9	L70.0	Quotation
	3		1.5								
	4		2								
	5		2.5								
	6		3								

T	H	Catalog No. Type	D	0.1mm increments L	Base unit price 1~49 pieces							
5	5	<b>JPW</b>	2	10.0~100.0	L10.0~29.9	L30.0	L30.1~49.9	L50.0	L50.1~69.9	L70.0	L70.1~99.9	L100.0
	8		3									
	10		4									
	12		5									
	14		6									
	16		8									
	18		10									

T	H	Catalog No. Type	D	0.1mm increments L	Base unit price 1~49 pieces							
5	5	<b>JPWH</b>	2	10.0~100.0	L10.0~29.9	L30.0	L30.1~49.9	L50.0	L50.1~69.9	L70.0	L70.1~99.9	L100.0
	8		3									
	10		4									
	12		5									
	14		6									
	16		8									
	18		10									

Order **Catalog No.** **L**  
**JP 4** — **28.5**

Days to Ship **Quotation**

Price **Quotation**

Alterations **Catalog No.** **L** **P** (RC-HC)  
**JP5** — **70.0** — **RC-HC8.0**

Alteration	Code	Spec.	1Code
	<b>RC</b>	Rounding of pin end to R0.2~0.3	Quotation
	<b>HC</b>	Head diameter change D≤HC<H 0.1mm increments	