

BALL PLUNGERS / WRENCHES

KNOCKOUT PINS / PUSHING PINS

COMPONENTS FOR GUIDE LIFTERS

Ball plungers — Normal type —

| Type | Main body | | | Ball | | SPRINGS | SPACERS | Service temp. range |
|-------------------|--|--|----------|-------------|------------|---------|---------|---------------------|
| | M | H | S | M | H | | | |
| Metal ball | For light load BPJ For heavy load BSJ For extremely heavy load BPW | SCM435 Equivalent to SUS304 SCM435 | 29~35HRC | Black oxide | SUJ2 | 55HRC~ | SWP-B | SUS304 |
| Resin ball | For light load NBPJ For heavy load NBSJ For extremely heavy load NBPW | S45C | 29~35HRC | Black oxide | Polyacetal | - | - | Brass |

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 | For light load (BPJ-NBPJ) | | For heavy load (BSJ-NBSJ) | | For extremely heavy load (BPW-NBPW) | | Catalog No. | Base unit price 1~49 pieces |
|------------|------------|-----|-----|----|---------------------------|---------------|---------------------------|---------------|-------------------------------------|---------------|-------------|-----------------------------|
| | | | | | Load (N) min. | Load (N) max. | Load (N) min. | Load (N) max. | Load (N) min. | Load (N) max. | | |
| 1 | 0.2 | — | — | 5 | 1 | 0.9 | 0.7 | 1.4 | 1.2 | 2 | — | — |
| 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 | 0.8 | — | 0.8 | 13 | 2.5 | 3 | 4.9 | 14.7 | 9.8 | 29.4 | 17.7 | 33.4 |
| 4 | — | 4 | — | 15 | 2.5 | 4 | 6.9 | 19.6 | 12.7 | 39.2 | 21.4 | 45.3 |
| 5 | — | 4.8 | — | 16 | 3 | 5 | 8.8 | 24.5 | 18.6 | 49 | 23.5 | 58.7 |
| 7 | — | 7.1 | — | 20 | 3 | 6 | 9.8 | 29.4 | 19.6 | 58.8 | 24.1 | 62.3 |
| 9.5 | — | 9.5 | — | 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 | M | H | | | |
| Metal ball | For light load BSM For heavy load BSZ For extremely heavy load BSX | Equivalent to SUS304 | SUS440C | 55HRC~ | SUS631J1 | SUS304 | - | -30~260°C |
| Resin ball | For light load NBSM For heavy load NBSZ For extremely heavy load NBSX | SUS304 | Polyacetal | - | - | - | - | -30~80°C |

Spacer, Load min., max.

RoHS

| Metal ball | Resin ball | L | ℓ | B | For light load (BSM) | | For light load (NBSM) | | For heavy load (BSZ-NBSZ) | | For extremely heavy load (BSX-NBSX) | | Catalog No. | Base unit price 1~49 pieces |
|------------|------------|-----|-----|----|----------------------|---------------|-----------------------|---------------|---------------------------|---------------|-------------------------------------|---------------|-------------|-----------------------------|
| | | | | | Load (N) min. | Load (N) max. | Load (N) min. | Load (N) max. | Load (N) min. | Load (N) max. | Load (N) min. | Load (N) max. | | |
| 1 | 0.2 | — | — | 5 | 1 | 0.9 | 0.7 | 1.4 | — | — | 1.2 | 2 | — | — |
| 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 | 3.3 | 9.8 | 2.9 | 9.8 | 4.9 | 19.6 | 11.2 | 24.1 |
| 3 | 0.8 | — | 0.8 | 13 | 2.5 | 3 | 5.1 | 15.3 | 4.9 | 14.7 | 9.8 | 29.4 | 17.7 | 33.4 |
| 4 | — | 4 | — | 15 | 2.5 | 4 | 5.5 | 19.1 | 6.9 | 19.6 | 12.7 | 39.2 | 21.4 | 45.3 |
| 5 | — | 4.8 | — | 16 | 3 | 5 | 8.9 | 24.1 | 8.8 | 24.5 | 18.6 | 49 | 23.5 | 60 |
| 7 | — | 7.1 | — | 20 | 3 | 6 | 10.5 | 29.3 | 9.8 | 29.4 | 19.6 | 58.8 | 24.1 | 63.7 |
| 9.5 | — | 9.5 | — | 25 | 3 | 8 | 14.9 | 48.9 | 15.7 | 49 | 29.4 | 98 | 43.6 | 116.3 |

Ⓜ 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 | BPJG 1 | — | — |
| 8 | BPJG 2 | — | — |
| 10 | BPJG 3 | — | — |
| 12 | BPJG 4 | — | — |
| 16 | BPJG 5 | — | — |

Ⓜ S45C
Ⓜ 34~43HRC
Ⓜ Black oxide (Fe₃O₄)

Ⓜ 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 ball plungers (BSJL-BSXL), short plungers, and resin type ball plungers.

Order Catalog No. BPJG2 Days to Ship Quotation

Knockout pins

RoHS

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

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 | KOP | 4 | 7.0~60.0 | 1.00~ 4.00 | Quotation |
| | 8 | | 6 | | 1.00~ 6.00 | |
| | 10 | | 8 | | 2.00~ 8.00 | |
| | 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

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

Pushing pins

RoHS

JP JPW JPWH

| Catalog No. | L | R |
|-------------|--------------------------------|-----------|
| JP | L ^{+0.3} ₀ | R≤0.3 |
| JPW JPWH | L±0.1 | 0.5≤R≤1.0 |

JP-JPW Ⓜ DH2F Ⓜ SKD61
Ⓜ 40HRC~ Ⓜ 50HRC~

| T | H | Catalog No. Type | D | 0.1mm increments L | Base unit price 1~49 pieces | | | | | | |
|---|---|------------------|-----|--------------------|-----------------------------|-------|------------|-------|------------|-------|--|
| | | | | | L5~29.9 | L30.0 | L30.1~49.9 | L50.0 | L50.1~69.9 | L70.0 | |
| 2 | 3 | JP | 1 | 5.0~70.0 | | | | | | | |
| | 3 | | 1.5 | | | | | | | | |
| | 4 | | 2 | | | | | | | | |
| | 5 | | 2.5 | | | | | | | | |
| | 6 | | 3 | | | | | | | | |
| | 8 | | 4 | | | | | | | | |
| | 9 | | 5 | | | | | | | | |

Quotation

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

Quotation

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

Quotation

Order Catalog No. — L
JP 4 — 28.5

Days to Ship Quotation

Price Quotation

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

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