

Ball Plungers

Economy / Standard

Ball Plungers

Stainless Steel / Roller / Load Adjustable

■ **Features:** By omitting heat treating, wrench slot and thread locking treatment, overwhelmingly low price is achieved.

■ **Economy**

Type	Body	Ball	Spring	Spacer	Operating Temperature			
	M Material	S Surface Treatment	M Material	H Hardness	M Material			
Light Load	BPU	EN 1.7220 Equiv.	Trivalent Chromate	EN 1.3505 Equiv.	55HRC~	JIS-SWP-B	EN 1.4301 Equiv.	-30~80°C
Heavy Load	BPM							
Extra Heavy Load	BPQ							

⚠ Values below are not guaranteed values but experimental values.

M (Coarse)	Breaking Torque (N-cm)
3	98
4	98
5	226
6	520
8	1726
10	2746
12	5099
16	7845
20	10787

RoHS10

Part Number	Type	M (Coarse)	d	S	L	l	B	Light Load (N)		Heavy Load (N)		Extra Heavy Load (N)		Unit Price
								min.	max.	min.	max.	min.	max.	
BPU BPM BPQ	3	1.5	0.5	7	1	1.5	1	2	1.5	2.9	2.2	5	-	
	4	2.5		9	2.4	2	2	4.9	3.9	9.8	2.5	12.5	-	
	5		0.8	12	2	2.5	2.9	9.8	4.9	19.6	11.2	24.1	-	
	6	3		13	2.5	3	4.9	14.7	9.8	29.4	17.7	33.4	-	
	8	4	1	15	2.5	4	6.9	19.6	12.7	39.2	21.4	45.3	-	
	10	5	1.2	16	3	5	8.8	24.5	18.6	49	23.5	58.7	-	
	12	7.1	1.8	20	3	6	9.8	29.4	19.6	58.8	24.1	62.3	-	
16	9.5	2.5	25	3	8	15.7	49	29.4	98	43.6	116	-		
20	11.9	4.5	40	6	10	53.9	98	78.4	147.6	84.6	196.6	-		

⚠ Has no Slit for a wrench on the tip. It can be installed only by using a hex socket. ⚠ Min. load is the initial load, and max. load is the one when the tip is fully compressed.

⚠ PACK-BPU is sold by the package. ⚠ For package sales, minimum order is 1 pack. ⚠ 100 pcs./package ⚠ For orders larger than indicated quantity, please request a quotation.

Part Number	Unit Price	(Reference)
Type	M (Coarse)	1 ~ 4 pack(s)
PACK-BPU (Light Load)	3	
	4	
	5	
	6	

■ **BPJF, BSJF:** BPJ, BSJ (Identical Standard Products mentioned in Press Catalog) are also available.

■ **Standard**

Type	Standard	Body	Ball	Spring	Spacer	Operating Temperature
	M Material	S Surface Treatment	M Material	H Hardness	M Material	
Ultra Light Load	BPY	BPY-N	EN 1.7220 Equiv.	29~35HRC	Black Oxide	-30~80°C
Light Load	BPJF	BPJ-N	EN 1.4301 Equiv.	-	-	-30~80°C
Heavy Load	BSJF	BSJ-N	EN 1.4301 Equiv.	55HRC~	JIS-SWP-B	-30~80°C
Extra Heavy Load	BPW	BPW-N	EN 1.7220 Equiv.	29~35HRC	Electroless Nickel Plating	-30~80°C
Ultra Light Load	NBPS	-	EN 1.1191 Equiv.	29~35HRC	Black Oxide	-30~80°C
Light Load	NBPJ	-				
Heavy Load	NBSJ	-				
Extra Heavy Load	NBPW	-				

⚠ Part Number is not RoHS Compliant

⚠ Thread Locking Treatment is not provided on M2, M3 and M4 of Standard Type. ⚠ Thread Locking Treatment is where anaerobic thread locking compound in micro capsules is used to retain the threads. Once parts have been loosened, adhesion is lost. Use an anaerobic thread locking compound when reassembling. ⚠ The thread locking is most effective by leaving the parts for 72 hours or more in 25°C. It should be noted if the parts are left for short period of time and in low temperature, the thread locking compound will be less-effective.

Part Number	Type	M (Coarse)	d	S	L	l	B	Ultra Light Load (N)		Light Load (N)		Heavy Load (N)		Extra Heavy Load (N)		Unit Price	
								min.	max.	min.	max.	min.	max.	min.	max.		
(Metal Ball) BPY (* only)	3	1.5	0.5	-	-	7	1	1.5	0.3	0.64	1	2	1.5	2.9	2.2	5	
	4	2.5		2.4		9	1.5	2	0.6	1.6	2	4.9	3.9	9.8	2.5	12.5	
	5	3	0.8	3.2	0.8	12	2	2.5	1	3.12	2.9	9.8	4.9	19.6	11.2	24.1	
	6	3		3.2		13	2.5	3	1.6	4.85	4.9	14.7	9.8	29.4	17.7	33.4	
	8	4	1	4	1.0	15	2.5	4	2.4	6.36	5.1	15.3	6.9	19.6	12.7	39.2	
	10	5	1.2	4.8	1.2	16	3	5	3	8.1	8.8	24.5	18.6	49	23.5	58.7	
	12	7.1	1.8	7.1	1.8	20	3	6	3.5	9.68	10.5	29.3	9.8	29.4	19.6	58.8	24.1
16	9.5	2.5	9.5	2.5	25	3	8	5.7	15.8	15.7	49	29.4	98	43.6	116	-	

⚠ M2, M3 and M4 have no slits for a wrench on the tip. It can be installed only by using a hex socket. ⚠ Min. load is the initial load, and max. load is the one when the tip is fully compressed. kgf=Nx0.101972

■ **No Thread Locking Compound**

Part Number	Type	M (Coarse)	d	S	L	l	B	Ultra Light Load (N)		Light Load (N)		Heavy Load (N)		Extra Heavy Load (N)		Unit Price
								min.	max.	min.	max.	min.	max.	min.	max.	
(Metal Ball) BPY-N BPJ-N BSJ-N BPW-N	5	3		0.8	12	2	2.5	1	3.12	2.9	9.8	4.9	19.6	11.2	24.1	-
	6	3		13	2.5	3	1.6	4.85	4.9	14.7	9.8	29.4	17.7	33.4	-	
	8	4	1	15	2.5	4	2.4	6.36	6.9	19.6	12.7	39.2	21.4	45.3	-	
	10	5	1.2	16	3	5	3	8.1	8.8	24.5	18.6	49	23.5	58.7	-	
	12	7	1.8	20	3	6	3.5	9.68	9.8	29.4	19.6	58.8	24.1	62.3	-	
	16	9.5	2.5	25	3	8	5.7	15.8	15.7	49	29.4	98	43.6	116	-	

⚠ Min. load is the initial load, and max. load is the one when the tip is fully compressed. kgf=Nx0.101972

Ordering Example

Part Number
BPQ3
PACK-BPU8
BPW-N12

■ **BSZF:** Equiv. to BSZ (old product). Up to 12% price reduction compared to BSZ.

■ **Stainless Steel**

Type	Body	Ball	Spring	Spacer	Operating Temperature
	M Material	S Surface Treatment	M Material	H Hardness	M Material
Ultra Light Load	BMS				
Light Load	BSM				
Heavy Load	BSZF				
Extra Heavy Load	BSX				
Ultra Light Load	NBSS				
Light Load	NBSM				
Heavy Load	NBSZ				
Extra Heavy Load	NBSX				

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Part Number	Type	Metal Ball		Plastic Ball		L	l	B	Ultra Light Load (BMS, NBSS) Load (N)		Light Load (BSM) Load (N)		Light Load (NBSM) Load (N)		Heavy Load (BSZF, NBSZ) Load (N)		Extra Heavy Load (BSX, NBSX) Load (N)		Unit Price	
		M (Coarse)	d	S	d				S	min.	max.	min.	max.	min.	max.	min.	max.	min.		max.
(Metal Ball)	BMS (* only)	2	1	0.2	-	-	5	1	0.9	-	-	0.7	1.4	-	-	1.2	2	-	-	-
	BSM (* only)	3	1.5	0.5	-	-	7	1	1.5	0.3	0.64	1	2	-	-	1.5	2.9	2.2	5	-
	BSZF (* only)	4	2.5		2.4		9	1.5	2	0.6	1.6	1.9	4.9	2	4.9	3.9	9.8	2.5	12.5	-
	BSX (* only)	5	3	0.8	3.2	0.8	12	2	2.5	1	3.12	3.3	9.8	2.9	9.8	4.9	19.6	11.2	24.1	-
(Plastic Ball)	NBSS (* only)	6	3		3.2		13	2.5	3	1.6	4.85	5.1	15.3	4.9	14.7	9.8	29.4	17.7	33.4	-
	NBSM (* only)	8	4	1	4.0	1.0	15	2.5	4	2.4	6.36	5.5	19.1	6.9	19.6	12.7	39.2	21.4	45.3	-
	NBSZ (* only)	10	5	1.2	4.8	1.2	16	3	5	3	8.1	8.9	24.1	8.8	24.5	18.6	49	23.5	60	-
	NBSX (* only)	12	7.1	1.8	7.1	1.8	20	3	6	3.5	9.68	10.5	29.3	9.8	29.4	19.6	58.8	24.1	63.7	-
		16	9.5	2.5	9.5	2.5	25	3	8	5.7	15.8	14.9	48.9	15.7	49	29.4	98	43.6	116.3	-

⚠ M2, M3 and M4 have no slits for a wrench on the tip. It can be installed only by using a hex socket. ⚠ Thread locking treatment not applied. kgf=Nx0.101972

■ **Roller**

Type	Body	Ball	Sub Ball	Spring	Operating Temperature
	M Material	S Surface Treatment	M Material	H Hardness	M Material
Metal Ball	BPRM	EN 1.4125 Equiv.	55HRC~	EN 1.4268 Equiv.	-30~100°C
Plastic Ball	BPRJ				

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■ **Features**

The combination structure of the main ball and the sub balls helps smooth rotation of the ball.

Part Number	Type	M (Coarse)	d	S	L	l	B	h	Load (N)		Unit Price
									min.	max.	
BPRM BPRJ	5	3	2.4	0.7	12	2	2.5	1.2	4.4	19.6	-
	6	3	3	0.8	13	3	1.5	8.1	29.6	-	
	8	4	4	1.3	15	4	2	12.6	39.8	-	
	10	5	5	1.6	16	5	2.5	13.5	44.4	-	
	12	7.1	7.1	2.3	20	6	3	16.1	46.9	-	
	16	9.5	9.5	3.1	25	8	4	26.1	88.2	-	

⚠ Has no Slit for a wrench on the tip. It can be installed only by using a hex socket. ⚠ Thread locking treatment not applied.

■ **Features:** By moving the nut for compressing the inner spring, the load can be adjusted freely.

■ **Load Adjustable**

Type	Body	Ball	Spring	Nut	Spacer	Operating Temperature
	M Material	S Surface Treatment	M Material	H Hardness	M Material	
Metal Ball	BPCF	EN 1.4305 Equiv.	55HRC~	EN 1.4301 (WPB) Equiv.	EN 1.4305 Equiv.	-30~80°C
Plastic Ball	NPCF					

⚠ For facilitating installation, the plunger is tightened approx. X=C/2mm at shipping.

Min. Tightening (X=0) Max. Tightening (X=Xmax)

Part Number	Type	M1 (Coarse)	Metal Ball		Plastic Ball		L	l	M2 (Fine)	C	X	Min. Tightening (X=0) Load (N)		Max. Tightening (X=Xmax) Load (N)		Unit Price	
			d	S	d	S						min.	max.	min.	max.	BPCF	NPCF
BPCF NPCF	8	4	1	4	1	16	6.4	5	1	0~2.6	10	20	32	41	-	-	
	10	4.8	1.2	4.8	1.2	18	6.5	6	1.3	0~2.7	7	21	38	52	-	-	
	12	7.1	1.8	7.1	1.8	22	6.6	8	1.8	0~2.8	3	29	42	62	-	-	

⚠ Has slits for a wrench on the tip. The rear hex socket is provided for load adjustments and can not be used to tighten the unit. Only the straight slot is used for tightening. ⚠ Load values are for reference, not guaranteed. ⚠ Thread locking treatment not applied. ⚠ Fix the plunger with the rear nut after load setting.

Ordering Example

Part Number
BSX8
BPRM10
BPCF8

Moving the front (ball side) nut back and forth enables users to change the load freely to the desired hardness. Then tightening the rear nut after adjustment prevents the front nut from loosening.