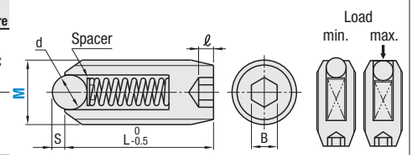
Ball Plungers

Stainless Steel / Roller / Load Adjustable

Ball Plungers – Stainless Steel

RoHS10

Type			Body M	Ball M	Ball H	Spring M	Spacer M	Operating Temperature
Metal Ball	Ultra Light Load	BMS	304 Stainless Steel Equivalent	440C Stainless Steel	55 HRC min.	631J1 Stainless Steel	304 Stainless Steel	-30–260°C
	Light Load	BSM						
	Heavy Load	BSZF						
	Extra Heavy Load	BSX						
Plastic Ball	Ultra Light Load	NBSS		Polyacetal	—	631J1 Stainless Steel	304 Stainless Steel	-30–80°C
	Light Load	NBSM						
	Heavy Load	NBSZ						
	Extra Heavy Load	NBSX						



Part Number Type	M (Coarse)	Metal Ball d	Metal Ball S	Plastic Ball d	Plastic Ball S	L	ℓ	B	Ultra Light Load (BMS / NBSS) Load (N) min.	Ultra Light Load (BMS / NBSS) Load (N) max.	Light Load (BSM) Load (N) min.	Light Load (BSM) Load (N) max.	Light Load (NBSM) Load (N) min.	Light Load (NBSM) Load (N) max.	Heavy Load (BSZF / NBSZ) Load (N) min.	Heavy Load (BSZF / NBSZ) Load (N) max.	Extra Heavy Load (BSX / NBSX) Load (N) min.	Extra Heavy Load (BSX / NBSX) Load (N) max.
Metal Ball	2	1	0.2	—	—	5	1	0.9	—	—	0.7	1.4	—	—	1.2	2	—	—
BMS (*only)	*3	1.5	0.5	—	—	7	1	1.5	0.3	0.64	1	2	—	—	1.5	2.9	2.2	5
BSM	**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
BSZF	**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
BSX (*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
Plastic Ball	**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
NBSS (*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
NBSM (*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
NBSZ (*only) NBSX (*only)	**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 screwdriver groove on the body tip. Plunger can be installed only by using an allen wrench. ⓘ Thread-locking adhesive not applied.

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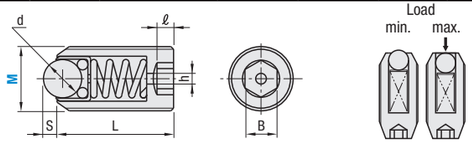
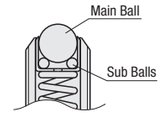
Ball Plungers – Roller

RoHS10

Type		Body Material	Ball Material	Ball Hardness	Sub Balls Material	Sub Balls Hardness	Spring Material	Operating Temperature
Metal Ball	BPRM	302HQ Stainless Steel	440C Stainless Steel	55 HRC min.	440C Stainless Steel	55 HRC min.	631J1 Stainless Steel	-30–100°C
Plastic Ball	BPRJ		Polyacetal	—				-30–80°C



Features



Adding sub balls to the plunger structure helps smooth rotation of the main ball.

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

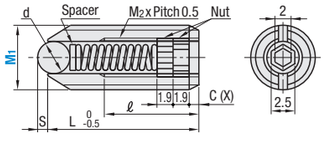
ⓘ Plunger has no screwdriver groove on the body tip. It can be installed only by using an allen wrench. ⓘ Thread-locking adhesive not applied.

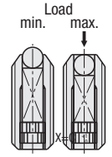
Features: By tightening the nut the inner spring is compressed, and the load can be adjusted freely.

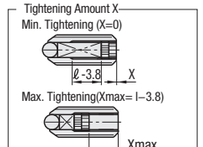
Ball Plungers – Load Adjustable

RoHS10

Type		Body Material	Ball Material	Ball Hardness	Spring Material	Nut Material	Spacer Material	Operating Temperature
Metal Ball	BPCF	303 Stainless Steel	440C Stainless Steel	55 HRC min.	304 Stainless Steel	303 Stainless Steel	304 Stainless Steel	-30–80°C
Plastic Ball	NPCF		Polyacetal	—				



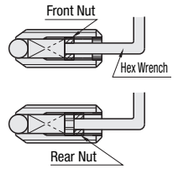




ⓘ For facilitating installation,the plunger is tightened approx. X=C+½mm at shipping.

Part Number Type	M1 (Coarse)	Metal Ball d	Metal Ball S	Plastic Ball d	Plastic Ball S	L	ℓ	M2 (Fine)	C	X	Min. Tightening (X=0) Load (N) min.	Min. Tightening (X=0) Load (N) max.	Max. Tightening(X=Xmax) Load (N) min.	Max. Tightening(X=Xmax) Load (N) max.
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 screwdriver on the tip. The rear hex socket is provided for load adjustments and can not be used to tighten the unit. Only the straight slit is used for tightening.
ⓘ Load values are for reference only.
ⓘ Thread locking treatment not applied.
ⓘ Fix the plunger with the rear nut after load setting.



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.

Part Number Example — Part Number: BSX8, BPRM10, BPCF8

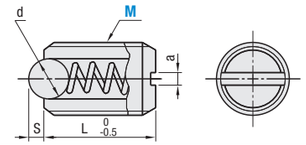
Ball Plungers

Plastic Resin / Fine Thread / Short

Ball Plungers – Plastic Resin

RoHS10

Type			Body Material	Ball Material	Ball Hardness	Spring Material	Operating Temperature
Metal Ball	Light Load	BSMN	Polyacetal (Black)	440C Stainless Steel	55 HRC min.	304 Stainless Steel	-30–80°C
	Heavy Load	BSZN	Nylon 66 (White)			631J1 Stainless Steel	
Plastic Ball	Light Load	BNMN	Polyacetal (Black)	Polyacetal (White)	—	304 Stainless Steel	
	Heavy Load	BNZN	Nylon 66 (White)			631J1 Stainless Steel	



Part Number Type	M (Coarse)	d	S	L	a	Load (N) Light Load min.	Load (N) Light Load max.	Load (N) Heavy Load min.	Load (N) Heavy Load max.
Metal Ball Plastic Ball	6	3.2	0.8	13	1	0.2	5	8	16
BSMN BNMN	8	4	1	15	1.2	2	12	15	30
BSZN BNZN	10	4.8	1.2	16	1.5	2.5	16	20	39

ⓘ Has no slit for a screwdriver on the tip.

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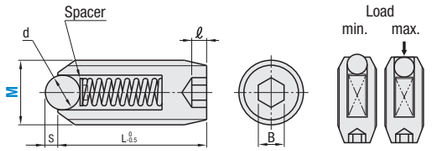
Part Number Example — Part Number: BSZN6

Ball Plungers – Fine Thread

RoHS10

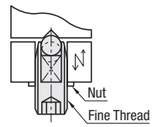
Type		Body Material	Body Hardness	Body Surface Treatment	Ball Material	Ball Hardness	Spring Material	Spacer Material	Operating Temperature
Light Load	BMPJ	1045 Carbon Steel or Equivalent	29~35 HRC	Black Oxide	52100 Bearing Steel	55 HRC min.	JIS SWP-B	304 Stainless Steel	-30–80°C
Heavy Load	BMSJ								



Features

Fine threads provide an easy adjustment of strokes.

Application Example



Part Number Type	M (Fine Thread)	Pitch (Fine)	Metal Ball d	Metal Ball S	L	ℓ	B	Light Load (N) min.	Light Load (N) max.	Heavy Load (N) min.	Heavy Load (N) max.
Light Load BMPJ Heavy Load BMSJ	3	0.35	1.5	0.5	7	1	1.5	1	2	1.5	2.9
	4	0.5	2.5	0.8	9	1.5	2	2	4.9	3.9	9.8
	5	0.5	3		12	2	2.5	2.9	9.8	4.9	19.6
	6	0.75	3		13	2.5	3	4.9	14.7	9.8	29.4
	8	0.75	4	1	15	2.5	4	6.9	19.6	12.7	39.2

ⓘ Thread-locking adhesive is not applied.

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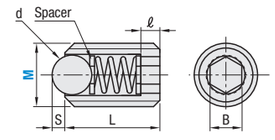
Part Number Example — Part Number: BMPJ5

Ball Plungers – Short

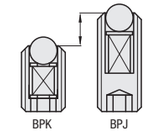
RoHS10

Type	Body Material	Ball Material	Ball Hardness	Spring Material	Spacer Material	Operating Temperature
BPK	302HQ Stainless Steel	440C Stainless Steel	59–66 HRC	304 Stainless Steel WPB	304 Stainless Steel	-30–240°C



Feature:

Less likely to protrude from thin plates, as the overall length is shorter than conventional ball plunger by 30%.



Part Number Type	M (Coarse)	d	S	L	ℓ	B	Load (N) min.	Load (N) max.
BPK	3	2	0.5	5	1	1.5	(1.0)	(2.0)
	4	2.5	0.8	6	1.2	2	(1.1)	(3.7)
	5	3		8	1.7	2.5	(2.2)	(5.9)
	6	4	1	9	1.8	3	(4.6)	(8.7)
	8	5	1.2	10	1.8	4	(7.5)	(11.9)

ⓘ Plunger has no screwdriver groove on the tip. It can be installed only by using an allen wrench. ⓘ Min. load is the initial load, and max. load is when the tip is fully compressed.

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Part Number Example — Part Number: BPK4