

# Plungers

## Overview

### Ball Plungers

Type	Economy	Standard	Roller	Load Adjustable	Plastic	Fine Thread	Short	Long
Features	By omitting the hardening on the plunger, competitive pricing is achieved.	General Ball Plunger	As the ball rotates smoothly, it prevents the mating parts from being damaged.	By compressing the inner spring, the load can be adjusted.	Ball Plunger with plastic body.	Fine threads provide an easy fine adjustment.	The overall length is shorter than conventional ball plungers by 30%.	The overall length is long and selectable. Plunger can be installed using nuts.
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Some products' Hex Holes are colored with markers for identifying products.

Type	Bolt	Flanged	Press-Fit	Press-Fit Rollers
Features	As the Plunger bodies are bolt shape, installation is very easy.	Flanges keep constant heights from the plate.	A Ball Plunger which has no threads on the outer diameter.	A Press-Fit Plunger with ball that rotates smoothly.
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### Roller Plungers

Type	Bolt	Flange Mount
Features	Easy to install.	Position can be adjusted using slotted holes
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### Spring Plungers

Type	Standard	Long Sleeve	Short	Micro	Micro Spring Pin	Tapped Nose	Hex Socket	Hex Nose	Flat Tip	Flanged
Features	General Spring Plungers.	With structure to bear diagonal loads.	A Spring Plunger with both short length and stroke.	The Small Diameter Type with $\phi 1.5-5$ in outer dimensions.	With resin tip	Stop pins can be mounted on the nose tip.	It can be mounted using a hex wrench.	As the pin is Hex shape, users can mount plunger using a wrench.	Suitable for working with its flat tip on the work.	Flanges keep constant heights from the plate.
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### Indexing Plungers

Type	Knobless	Flanged	Tapped Nose	Short Threads	Compact	Long	With Precision Pilot	Press-Fitted
Features	Most general Indexing Plungers	Flange plate allows for positioning adjustment.	An attachment can be mounted on the nose tip.	Has shorter threads than those of the Standard Type and saves space.	As the overall length is 2/3 that of conventional products, it can be used in the limited space.	As this Type has longer mounting threads than those of the Standard Type, it can be mounted to a thick plate.	The combination of pilots and the inner structure keeps high repeatability.	Press-fit when installing.
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Type	Knobless	Lever Type	Push Type	Plate Mount Type
Features	The most suitable knob for each purpose can be mounted.	Can be used in limited spaces.	A Push-Type can be operated by one finger.	Can be used in a location with limited space.
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### Ball Lock Pins

Type	Spring	Push Type
Features	Balls are spring loaded.	Ball retraction is controlled by push of a button
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# Ball Plungers

## Economy / Standard

Type	Body		Ball		Spring Material	Spacer Material	Operating Temperature
	Material	Surface Treatment	Material	Hardness			
Light Load	BPJ	4137 Alloy Steel	Trivalent Chromate	52100 Bearing Steel	55 HRC min.	JIS SWP-B	304 Stainless Steel
Heavy Load	BPM						
Extra Heavy Load	BPQ						

  

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

Values in table are for reference only.

Part Number	M (Coarse)	d	S	L	ℓ	B	Light Load (N)		Heavy Load (N)		Extra Heavy Load (N)	
							min.	max.	min.	max.	min.	max.
BPJ 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 slits for a wrench 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.

Type	Standard	w/o Thread-Locking Adhesive	Body		Ball		Spring	Spacer	Operating Temperature		
			Material	Hardness	Surface Treatment	Material	Hardness	Material		Material	
Metal Ball	Ultra Light Load	BPY	BPY-N	4137 Alloy Steel	29-35 HRC min.	Black Oxide	52100 Bearing Steel	55 HRC min.	JIS SWP-B	304 Stainless Steel	-30~80°C
	Light Load	BPJF	BPJ-N								
	Heavy Load	BSJF	BSJ-N	304 Stainless Steel or Equivalent							
Plastic Ball	Ultra Light Load	NBPS		1045 Carbon Steel or Equivalent	29-35 HRC min.	Black Oxide	Polyacetal		JIS SWP-B	304 Stainless Steel	-30~80°C
	Light Load	NBPJ									
	Heavy Load	NBSJ									
Extra Heavy Load	NBPW								Brass		

Part Number	M (Coarse)	Metal Ball		Plastic Ball		L	ℓ	B	Ultra Light Load (N)		Light Load (N)		Heavy Load (N)		Extra Heavy Load (N)	
		d	S	d	S				min.	max.	min.	max.	min.	max.	min.	max.
Metal Ball BPY (*only) BPJF BSJF BPW (*only)	2	1	0.2	—	—	5	1	0.9	—	—	0.7	1.4	1.2	2	—	—
	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	6.9	19.6	12.7	39.2	21.4	45.3
	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	9.8	29.4	19.6	58.8	24.1	62.3
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 / M4 have no slits for a screwdriver 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.

### W/O Thread-locking Adhesive

Part Number	M (Coarse)	d	S	L	ℓ	B	Ultra Light Load (N)		Light Load (N)		Heavy Load (N)		Extra Heavy Load (N)	
							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 when the tip is fully compressed.

Part Number Example: BPQ8, BPW-N12