



Ball Spline with Integrated Ball Screw

DSP



Combined linear motion guide and drive element
that transmits high thrust with smooth movement

Ball Spline with Integrated Ball Screw

DSP

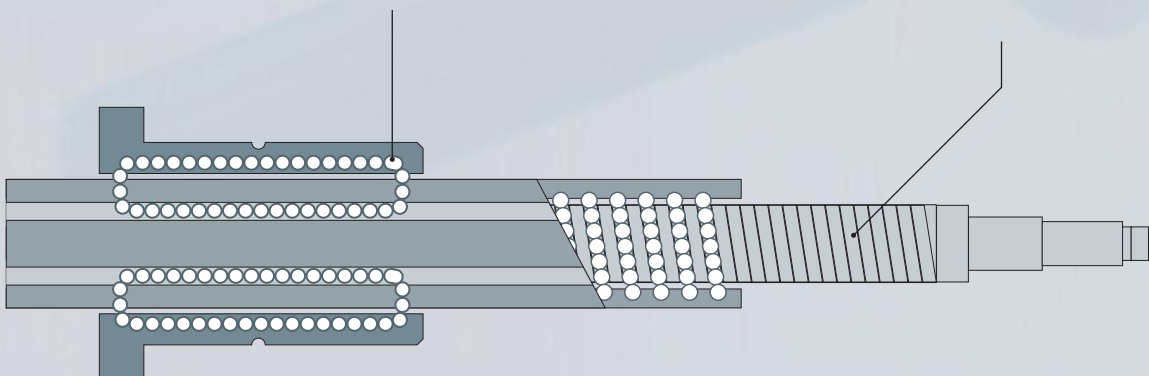
High thrust is transmitted with smooth motion by combining a ball spline, which serves as a linear motion guide, with a ball screw, which serves as the driving force.



Ball spline

Ball screw

Linear motion guide × Drive element



Ball spline

The ball spline provides smooth motion as balls roll along raceways precisely ground into the spline shaft.

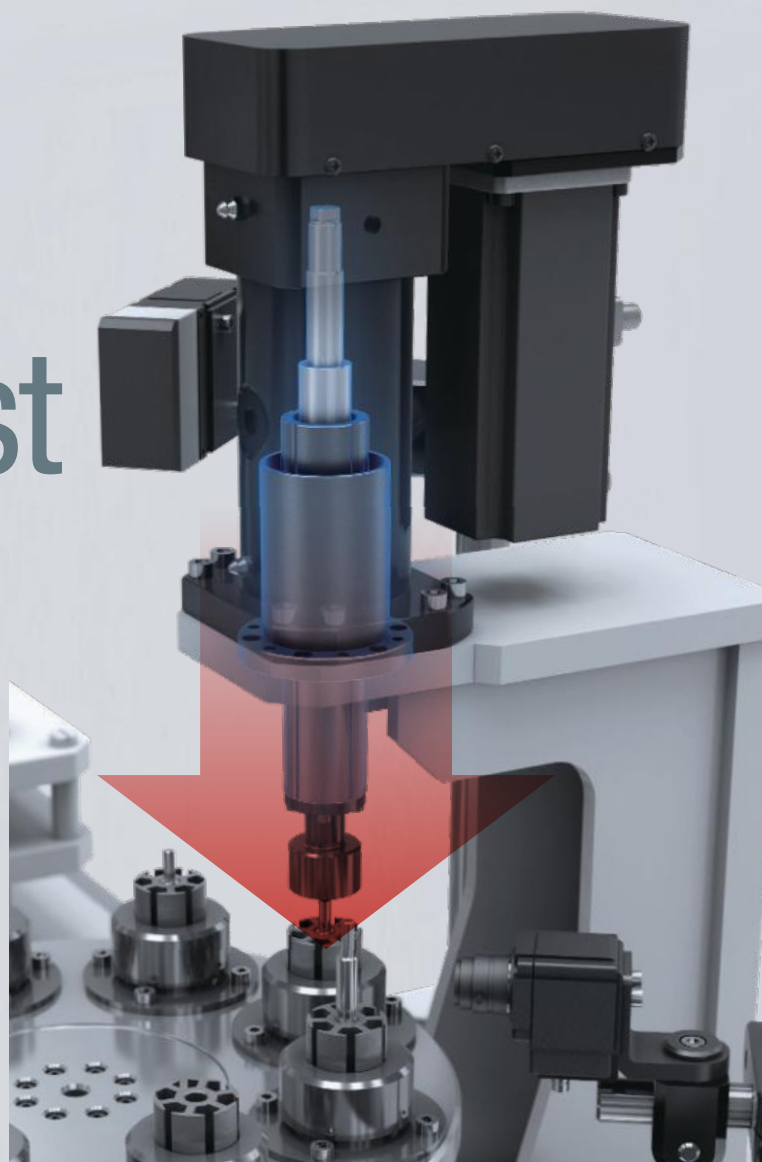
Ball screw

The ball screw provides high drive efficiency for linear and rotary motion, moving via balls that circulate between the screw shaft and nut.



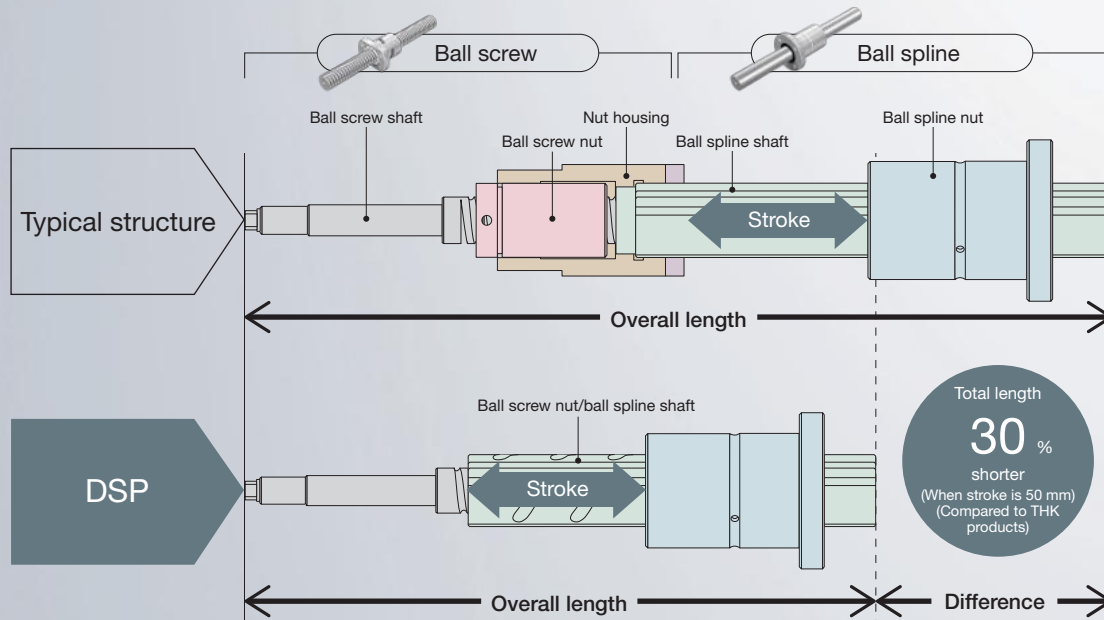
High thrust

Combined with a reduction gear, the DSP is suited for press applications that require high thrust, such as press fitting and caulking.



Machine requires less space due to compact structure

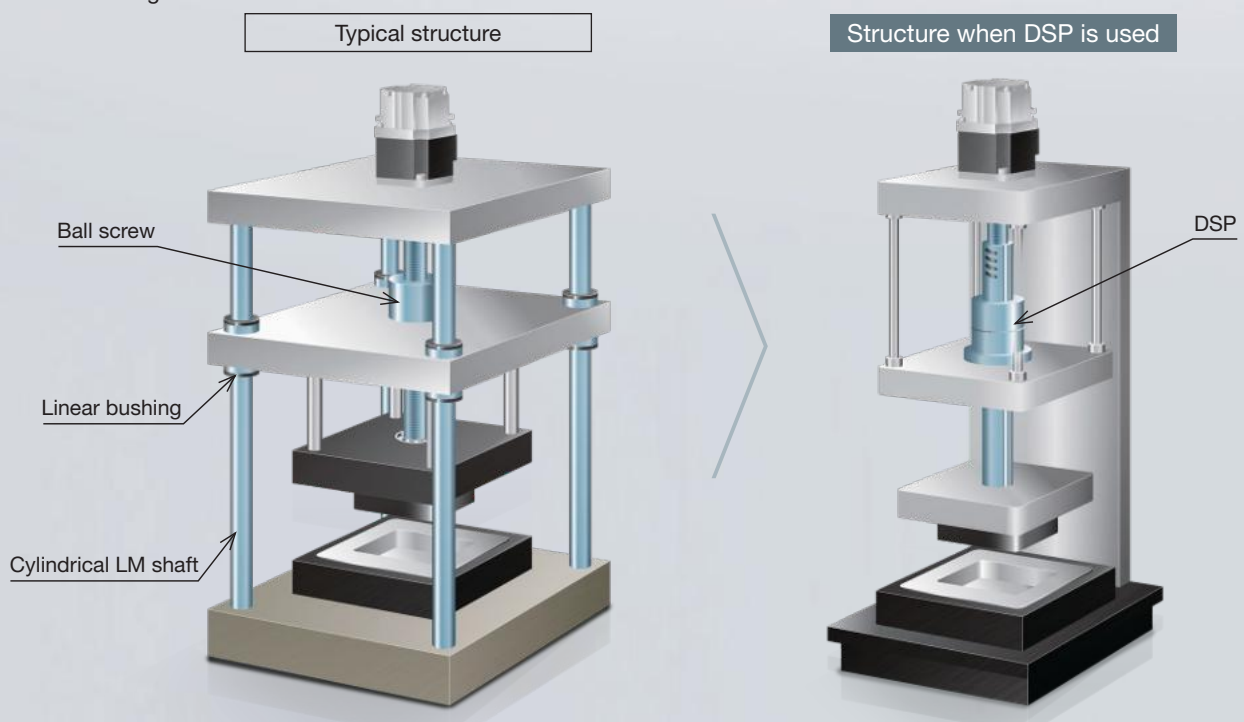
The overall length of the DSP is compact compared to conventional products due to its unique structure, which combines the linear motion guide and drive element. As a result, incorporating the DSP in equipment allows for space savings in height and width.



Reduces equipment design and fabrication time

The DSP has fewer components than conventional products, helping to reduce equipment design and fabrication time through a reduction in assembly time and manufactured parts.

Press forming machine

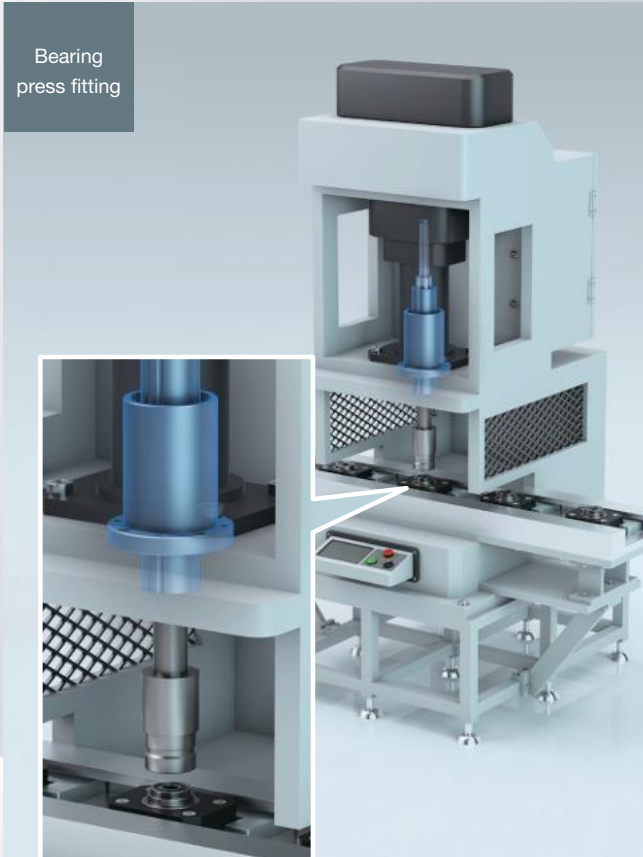


Application examples

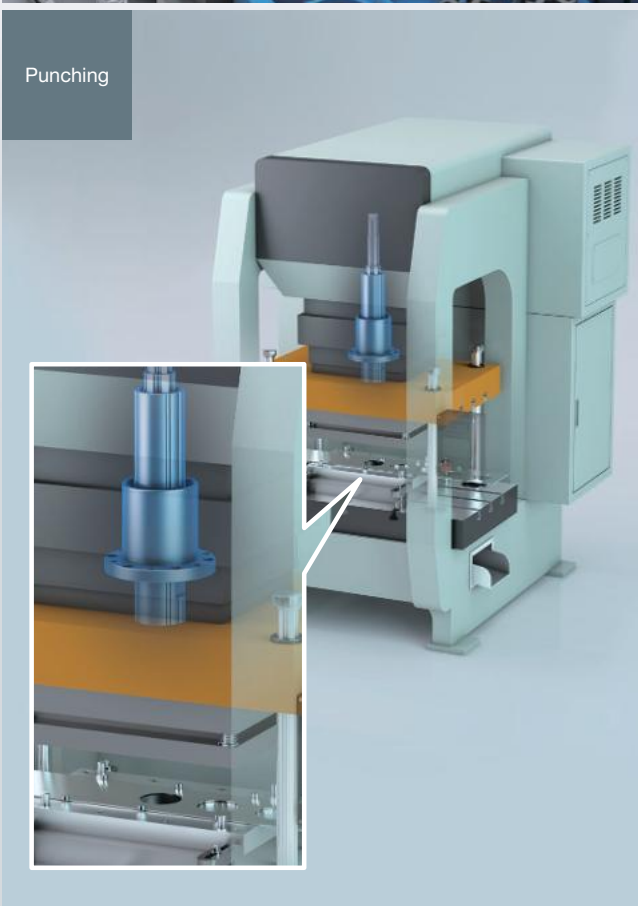
Press fitting
of parts



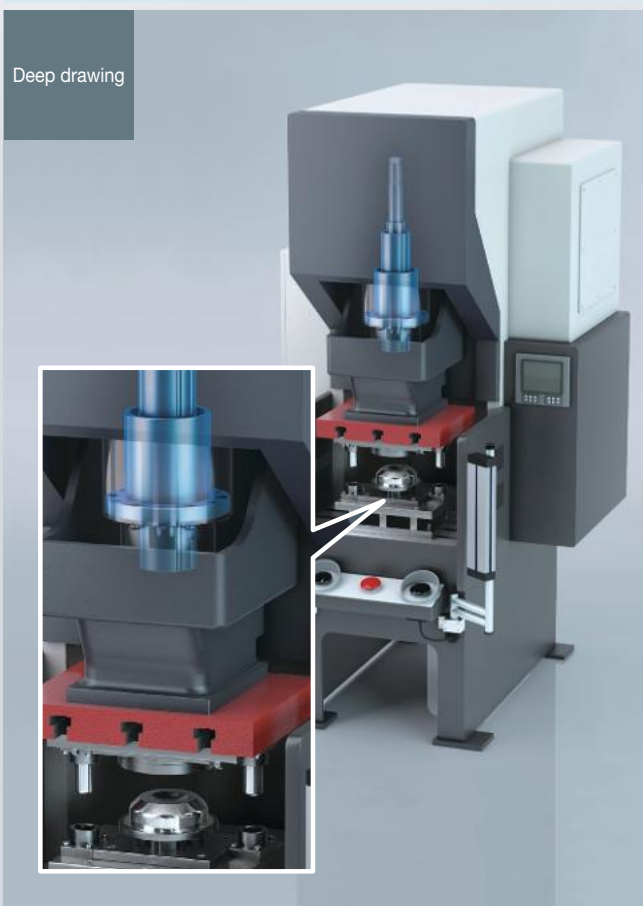
Bearing
press fitting



Punching

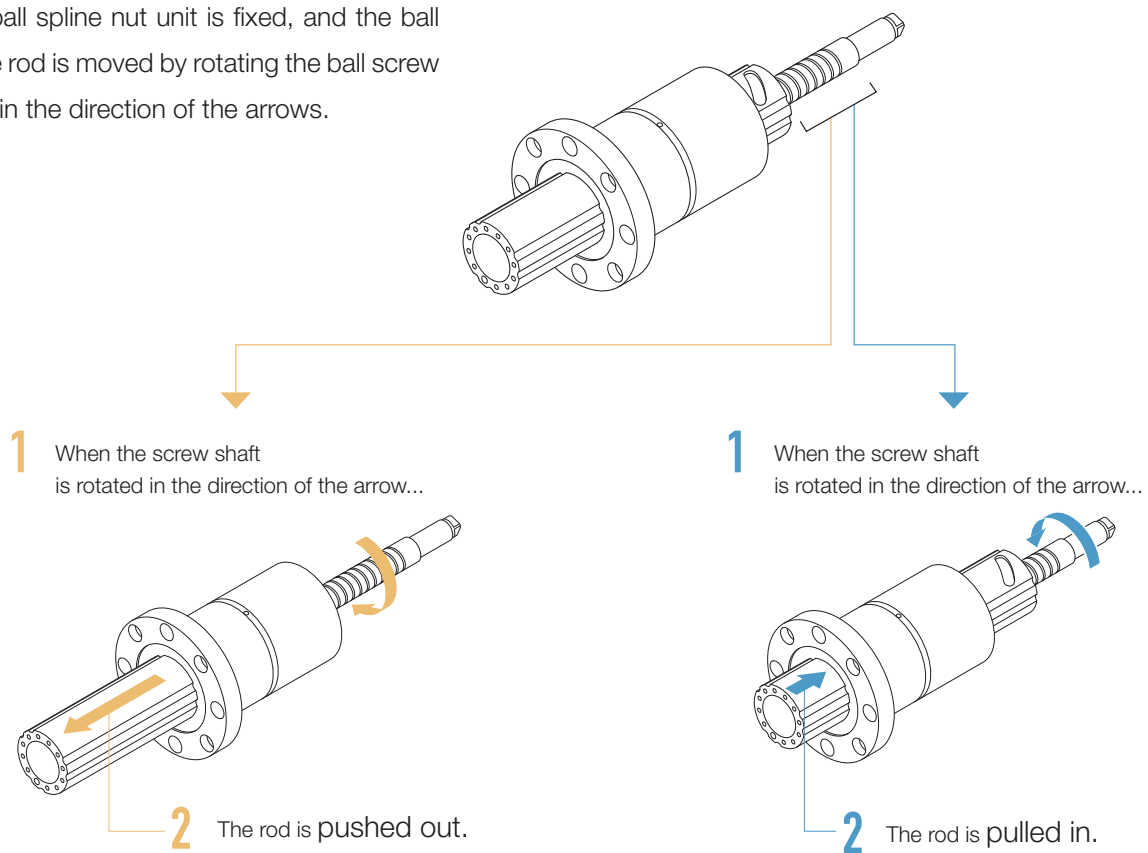


Deep drawing



Movement Mechanism

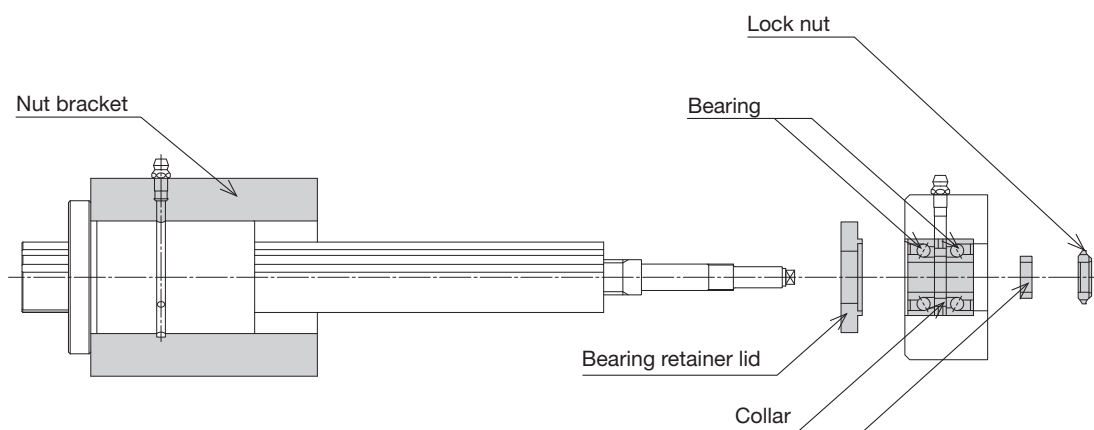
The ball spline nut unit is fixed, and the ball spline rod is moved by rotating the ball screw shaft in the direction of the arrows.



Assembly Example

The spline nut is mounted on the nut bracket.

After mounting the bearing on the fixed side, the lock nut is tightened and secured on the ball screw shaft side.



Model Number Coding

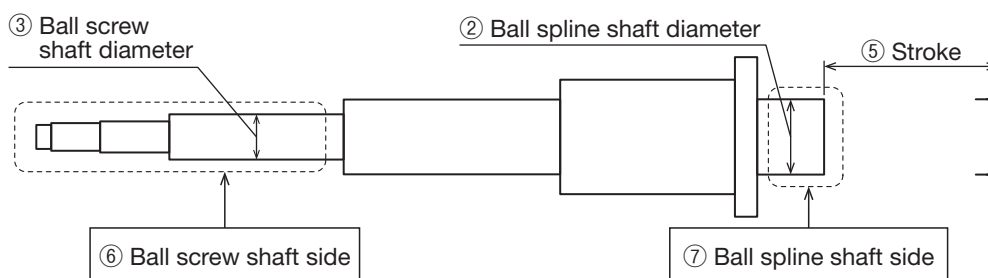
Model	Ball spline shaft diameter	Ball screw shaft diameter	Ball screw lead	Stroke	Shaft end shape		Options	Customization 1 (Surface treatment)	Customization 2	Customization 3	Customization 4
①	②	③	④	⑤	⑥ Ball screw shaft side	⑦ Ball spline shaft side	⑧	⑨	⑩	⑪	⑫
DSP	30	16	06	050	M	N	N	N	X	N	N
DSP	30: 30 mm 40: 40 mm 50: 50 mm 60: 60 mm 80: 80 mm	16: 16 mm 20: 20 mm 25: 25 mm 32: 32 mm 36: 36 mm 50: 50 mm	06: 6 mm 08: 8 mm 10: 10 mm 10H: 10 mm 12: 12 mm	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm	M: Straight shaft (standard)	N: Standard (DSP 30 to 60: End face tap) (DSP 80: Inner diameter threading) A: Outer diameter threading B: Inner diameter threading C: End face tap	N: None	N: No surface treatment S: With surface treatment (THK AP-C treatment)	X	N: None	N: None

Combination Options

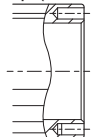
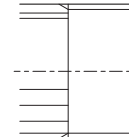
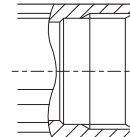
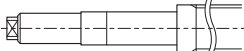
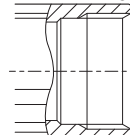
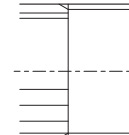
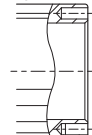
①	②	③	④
DSP	30	16	06
	40	20	06
	50	25	08
	60	32	06
	60	36	10
	80	50	10H
			12

① ②		Shaft end shape	
		⑥ ⑦ Ball screw shaft side	Ball spline shaft side
DSP30 to DSP60	MN	Straight shaft	End face tap
	MA	Straight shaft	Outer diameter threading
	MB	Straight shaft	Inner diameter threading
DSP80	MN	Straight shaft	Inner diameter threading
	MA	Straight shaft	Outer diameter threading
	MC	Straight shaft	End face tap

Note: Standard shaft end shape varies by model. See figures below for details.



Shaft End Shape

①②	⑥ Ball screw shaft side	⑦ Ball spline shaft side		
DSP30 to 60	Symbol: M	Symbol: N	Symbol: A	Symbol: B
	Straight shaft 	End face tap (standard) 	Outer diameter threading 	Inner diameter threading 
DSP80	Symbol: M	Symbol: N	Symbol: A	Symbol: C
	Straight shaft 	Inner diameter threading (standard) 	Outer diameter threading 	End face tap 

Customization 1

Surface Treatment (THK AP-C Treatment)

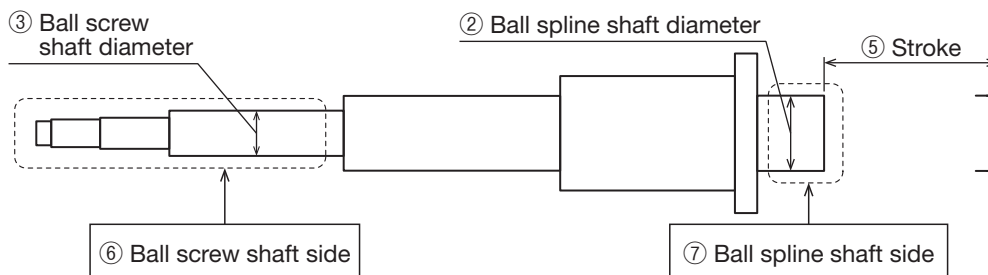
Surface treatment (AP-C treatment) can be selected to increase corrosion resistance.



DSP30 1606

Model Number Coding

Model	Ball spline shaft diameter	Ball screw shaft diameter	Ball screw lead	Stroke	Shaft end shape		Options	Customization 1 (Surface treatment)	Customization 2	Customization 3	Customization 4
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
DSP	30	16	06	050	M	N	N	N	X	N	N
DSP	30	16	06	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm	M: Straight shaft (standard)	N: End face tap (standard) A: Outer diameter threading B: Inner diameter threading	N: None	N: No surface treatment S: With surface treatment (THK AP-C treatment)	X	N: None	N: None



Shaft End Shape

⑥ Ball screw shaft side	⑦ Ball spline shaft side		
Symbol: M	Symbol: N	Symbol: A	Symbol: B
Straight shaft 	End face tap (standard) 	Outer diameter threading 	Inner diameter threading

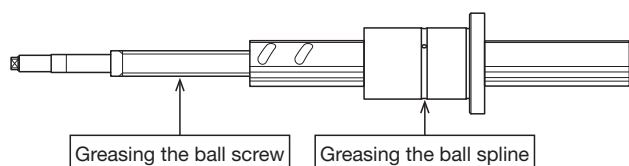
Basic Specifications

DSP	Constant axial load (kN)*	1.6
	Instantaneous axial load (kN)*	3.3
Ball screw	Ball screw lead (mm)	6
	Basic dynamic load rating C_a (kN)	9.7
	Basic static load rating C_0a (kN)	18.3
	Ball screw shaft diameter (mm)	$\phi 16$
	Ball screw shaft thread minor diameter (mm)	$\phi 13.2$
	Ball center-to-center diameter (mm)	$\phi 16.8$
	Axial clearance (mm)	0.010 max (G1)
	Accuracy grade	C5
	DN value	70000
Ball spline	Basic dynamic load rating C (kN)	20.5
	Basic static load rating C_0 (kN)	34
	Ball spline shaft diameter (mm)	$\phi 30$
	Clearance in the rotational direction (mm)	-0.010 to -0.004 (CL: light preload)

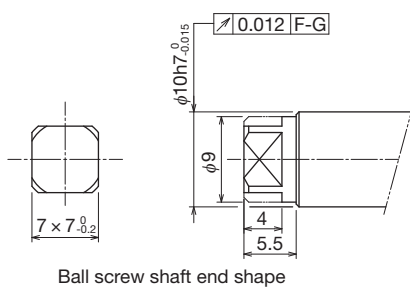
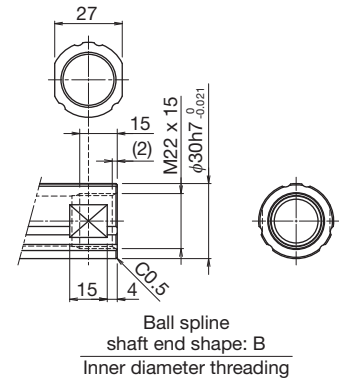
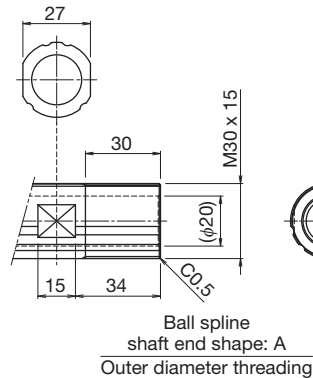
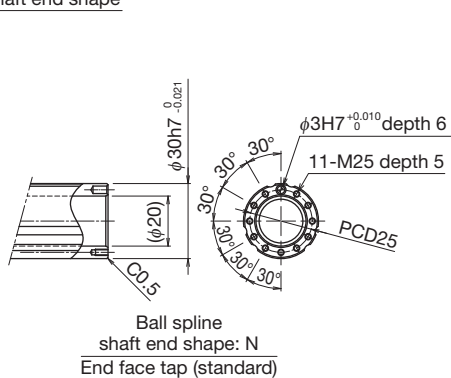
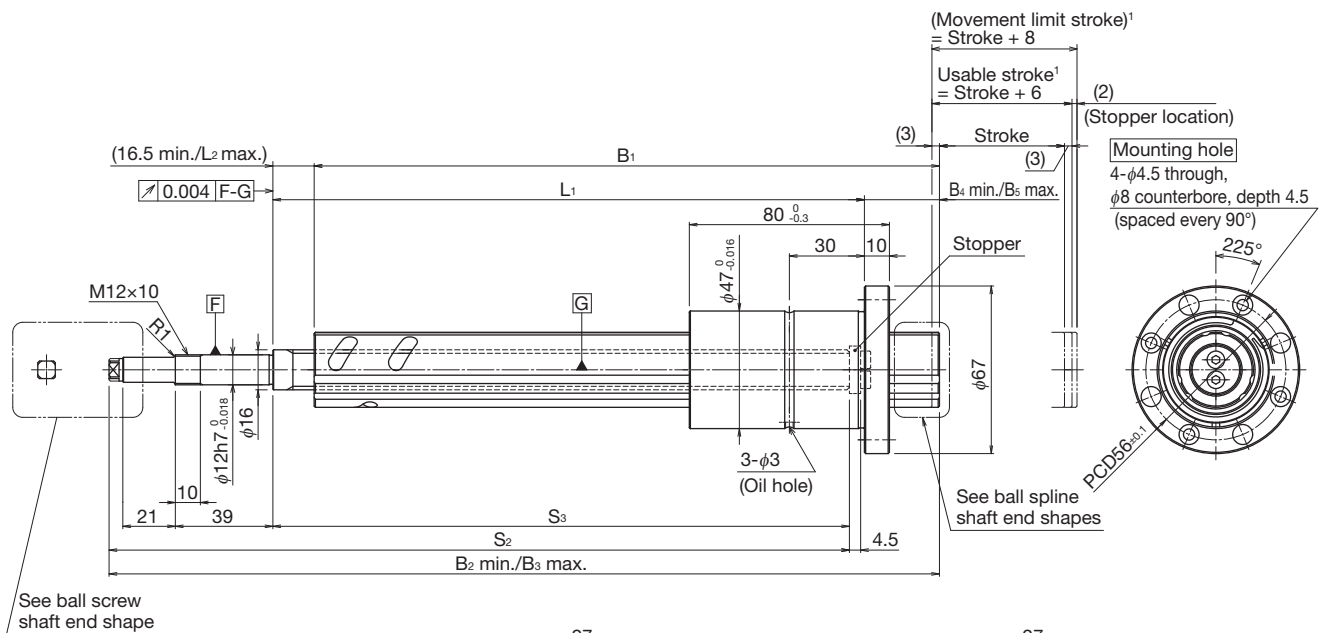
* This value is estimated. Please consider the strength of the mounting part.

Maintenance

For the ball screw, apply grease directly to the screw shaft.
For the ball spline, replenish lubricant from the oil hole of the ball spline nut and apply grease directly to the ball spline shaft.



Dimensions



¹ Use the product within the usable stroke range.

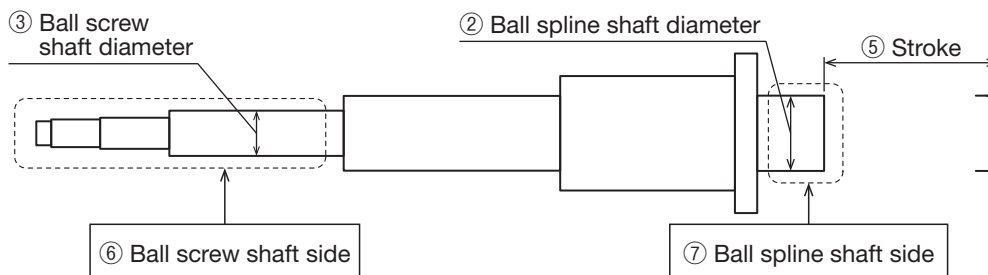
Stroke (mm) (Max. usable stroke)		50 (56)			100 (106)			150 (156)			200 (206)			250 (256)		
Dimensions (mm)	L ₁	136.5			186.5			236.5			286.5			336.5		
	L ₂	66.5			116.5			166.5			216.5			266.5		
Ball screw shaft dimensions (mm)	S ₂	196			246			296			346			396		
	S ₃	130.5			180.5			230.5			280.5			330.5		
Ball spline shaft end shape ²		N	A	B	N	A	B	N	A	B	N	A	B	N	A	B
Ball spline shaft dimensions (mm)	B ₁	150	185	155	200	235	205	250	285	255	300	335	305	350	385	355
	B ₂	232	267	237	282	317	287	332	367	337	382	417	387	432	467	437
	B ₃	282	317	287	382	417	387	482	517	487	582	617	587	682	717	687
	B ₄	30	65	35	30	65	35	30	65	35	30	65	35	30	65	35
	B ₅	80	115	85	130	165	135	180	215	185	230	265	235	280	315	285
Mass (kg)		1.3			1.5			1.8			2			2.2		

² Ball spline shaft end shapes: N: End face tap (standard), A: Outer diameter threading, B: Inner diameter threading.

DSP40 2006

Model Number Coding

Model	Ball spline shaft diameter	Ball screw shaft diameter	Ball screw lead	Stroke	Shaft end shape		Options	Customization 1 (Surface treatment)	Customization 2	Customization 3	Customization 4
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
DSP	40	20	06	050	M	N	N	N	X	N	N
DSP	40	20	06	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm	M: Straight shaft (standard)	N: End face tap (standard) A: Outer diameter threading B: Inner diameter threading	N: None	N: No surface treatment S: With surface treatment (THK AP-C treatment)	X	N: None	N: None



Shaft End Shape

⑥ Ball screw shaft side	⑦ Ball spline shaft side		
Symbol: M	Symbol: N	Symbol: A	Symbol: B
Straight shaft	End face tap (standard)	Outer diameter threading	Inner diameter threading

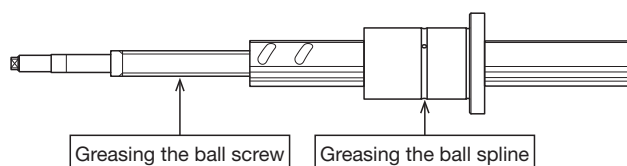
Basic Specifications

DSP	Constant axial load (kN)*	3.2
	Instantaneous axial load (kN)*	6.4
Ball screw	Ball screw lead (mm)	6
	Basic dynamic load rating C_a (kN)	17.7
	Basic static load rating C_0a (kN)	35.8
	Ball screw shaft diameter (mm)	$\phi 20$
	Ball screw shaft thread minor diameter (mm)	$\phi 16.4$
	Ball center-to-center diameter (mm)	$\phi 21$
	Axial clearance (mm)	0.010 max (G1)
	Accuracy grade	C5
	DN value	70000
Ball spline	Basic dynamic load rating C (kN)	37.8
	Basic static load rating C_0 (kN)	60.5
	Ball spline shaft diameter (mm)	$\phi 40$
	Clearance in the rotational direction (mm)	-0.016 to -0.008 (CL: light preload)

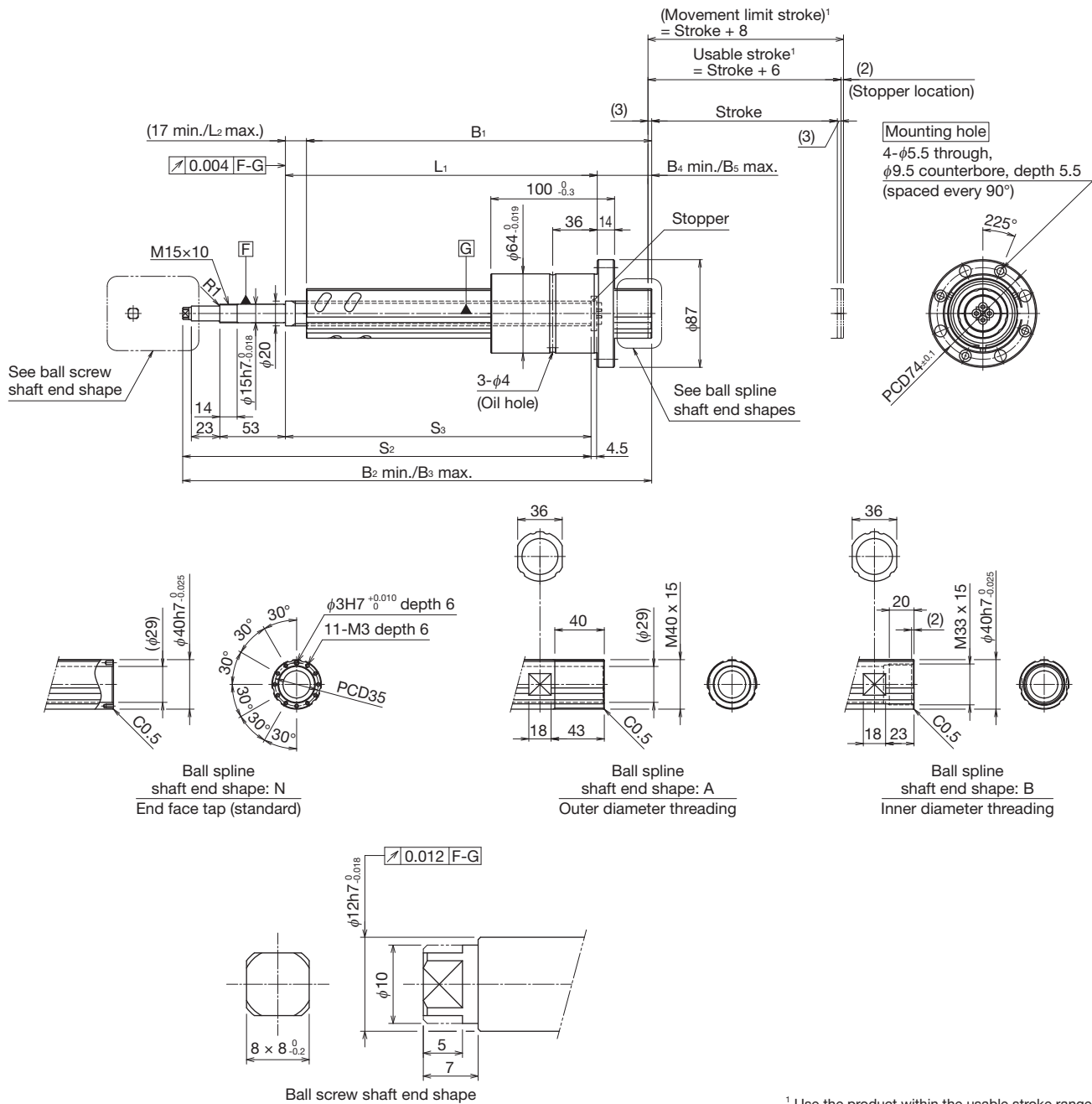
* This value is estimated. Please consider the strength of the mounting part.

Maintenance

For the ball screw, apply grease directly to the screw shaft.
For the ball spline, replenish lubricant from the oil hole of the ball spline nut and apply grease directly to the ball spline shaft.



Dimensions



¹ Use the product within the usable stroke range.

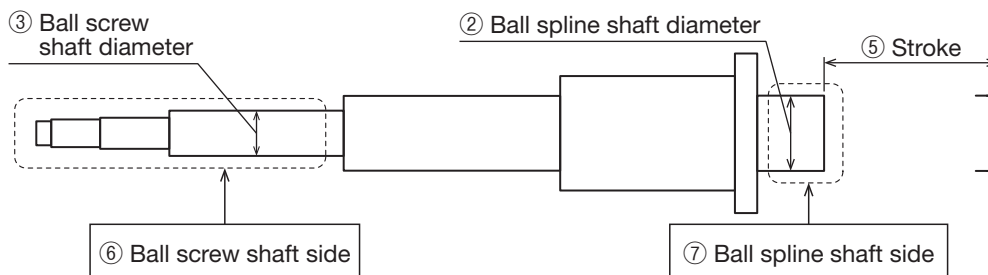
Stroke (mm) (Max. usable stroke)		50 (56)			100 (106)			150 (156)			200 (206)			250 (256)		
Dimensions (mm)	L ₁	152			202			252			302			352		
	L ₂	67			117			167			217			267		
Ball screw shaft dimensions (mm)	S ₂	230			280			330			380			430		
	S ₃	147			197			247			297			347		
Ball spline shaft end shape ²		N	A	B	N	A	B	N	A	B	N	A	B	N	A	B
Ball spline shaft dimensions (mm)	B ₁	179	216	196	229	266	246	279	316	296	329	366	346	379	416	396
	B ₂	279	316	296	329	366	346	379	416	396	429	466	446	479	516	496
	B ₃	329	366	346	429	466	446	529	566	546	629	666	646	729	766	746
	B ₄	44	81	61	44	81	61	44	81	61	44	81	61	44	81	61
	B ₅	94	131	111	144	181	161	194	231	211	244	281	261	294	331	311
Mass (kg)		2.7			3.1			3.4			3.8			4.1		

² Ball spline shaft end shapes: N: End face tap (standard), A: Outer diameter threading, B: Inner diameter threading.

DSP40 2508

Model Number Coding

Model	Ball spline shaft diameter	Ball screw shaft diameter	Ball screw lead	Stroke	Shaft end shape		Options	Customization 1 (Surface treatment)	Customization 2	Customization 3	Customization 4
					Ball screw shaft side	Ball spline shaft side		⑨	⑩	⑪	⑫
① DSP	② 40	③ 25	④ 08	⑤ 050	⑥ M	⑦ N	⑧ N				
DSP	40	25	08	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm	M: Straight shaft (standard)	N: End face tap (standard) A: Outer diameter threading B: Inner diameter threading	N: None	N: No surface treatment S: With surface treatment (THK AP-C treatment)	X	N: None	N: None



Shaft End Shape

⑥ Ball screw shaft side	⑦ Ball spline shaft side		
Symbol: M	Symbol: N	Symbol: A	Symbol: B
Straight shaft 	End face tap (standard) 	Outer diameter threading 	Inner diameter threading

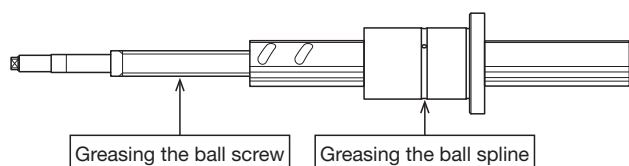
Basic Specifications

DSP	Constant axial load (kN)*	5.6
	Instantaneous axial load (kN)*	11.2
Ball screw	Ball screw lead (mm)	8
	Basic dynamic load rating C_a (kN)	30.4
	Basic static load rating C_0a (kN)	75
	Ball screw shaft diameter (mm)	$\phi 25$
	Ball screw shaft thread minor diameter (mm)	$\phi 21.4$
	Ball center-to-center diameter (mm)	$\phi 26$
	Axial clearance (mm)	0.010 max (G1)
	Accuracy grade	C5
	DN value	70000
Ball spline	Basic dynamic load rating C (kN)	37.8
	Basic static load rating C_0 (kN)	60.5
	Ball spline shaft diameter (mm)	$\phi 40$
	Clearance in the rotational direction (mm)	-0.016 to -0.008 (CL: light preload)

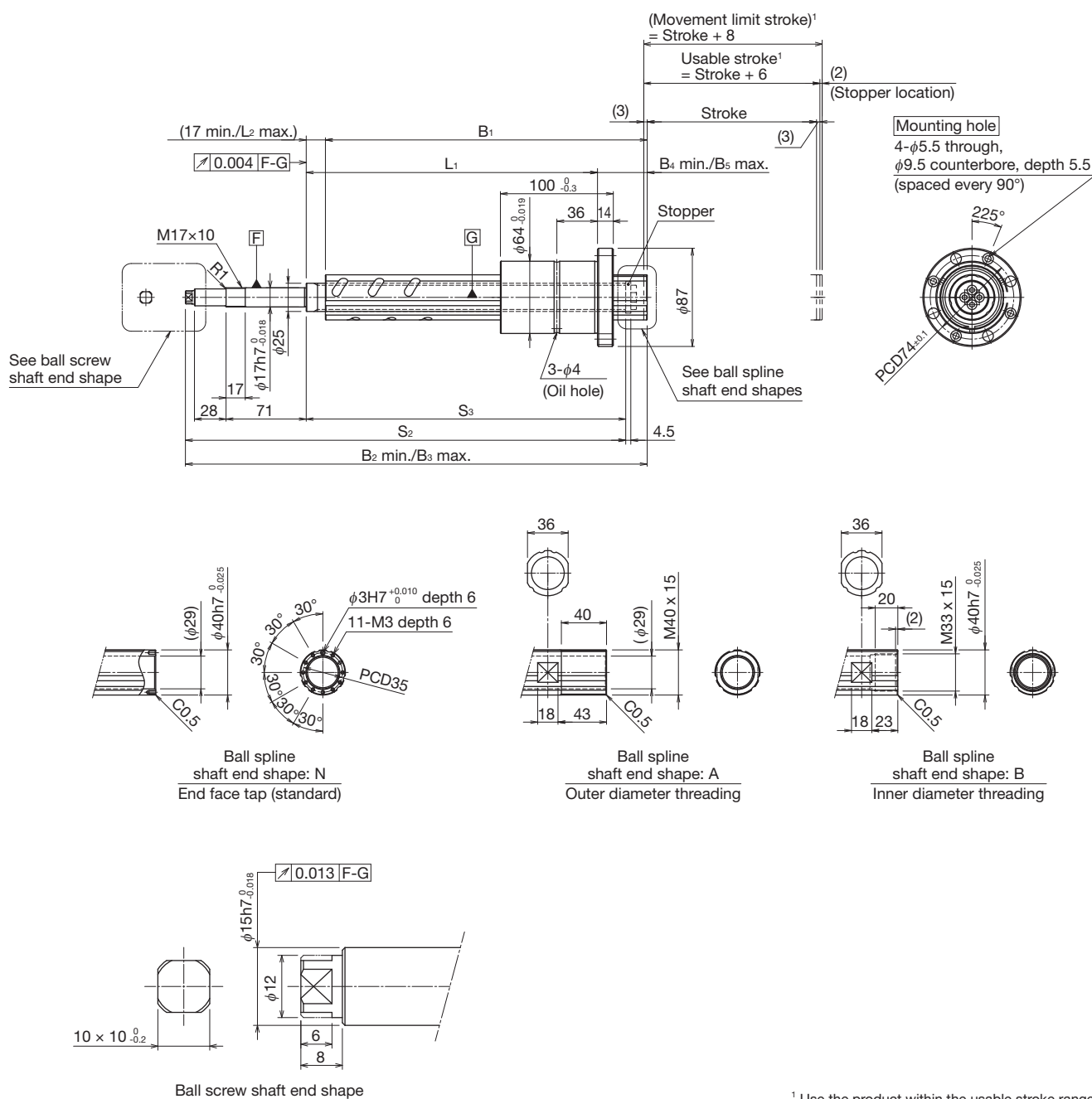
* This value is estimated. Please consider the strength of the mounting part.

Maintenance

For the ball screw, apply grease directly to the screw shaft.
For the ball spline, replenish lubricant from the oil hole of the ball spline nut and apply grease directly to the ball spline shaft.



Dimensions



¹ Use the product within the usable stroke range.

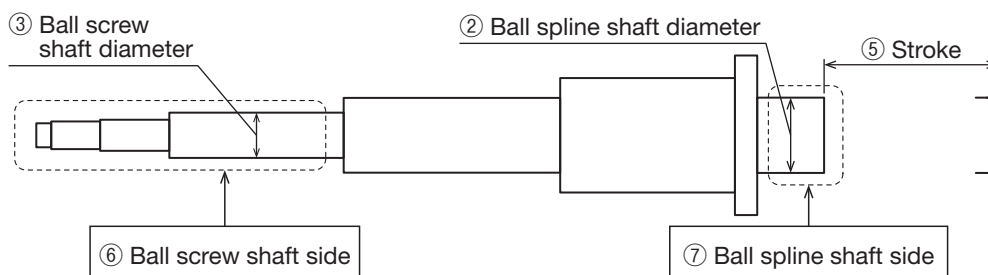
Stroke (mm) (Max. usable stroke)		50 (56)			100 (106)			150 (156)			200 (206)			250 (256)		
Dimensions (mm)	L ₁	158			208			258			308			358		
	L ₂	67			117			167			217			267		
Ball screw shaft dimensions (mm)	S ₂	290			340			390			440			490		
	S ₃	183			233			283			333			383		
Ball spline shaft end shape ²		N	A	B	N	A	B	N	A	B	N	A	B	N	A	B
Ball spline shaft dimensions (mm)	B ₁	185	222	202	235	272	252	285	322	302	335	372	352	385	422	402
	B ₂	309	346	326	359	396	376	409	446	426	459	496	476	509	546	526
	B ₃	359	396	376	459	496	476	559	596	576	659	696	676	759	796	776
	B ₄	44	81	61	44	81	61	44	81	61	44	81	61	44	81	61
	B ₅	94	131	111	144	181	161	194	231	211	244	281	261	294	331	311
Mass (kg)		3.1			3.5			4			4.4			4.8		

² Ball spline shaft end shapes: N: End face tap (standard), A: Outer diameter threading, B: Inner diameter threading.

DSP50 3206

Model Number Coding

Model	Ball spline shaft diameter	Ball screw shaft diameter	Ball screw lead	Stroke	Shaft end shape		Options	Customization 1	Customization 2	Customization 3	Customization 4
					Ball screw shaft side	Ball spline shaft side		(Surface treatment)			
① DSP	② 50	③ 32	④ 06	⑤ 050	⑥ M	⑦ N	⑧ N	⑨ N	⑩ X	⑪ N	⑫ N
DSP	50	32	06	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm	M: Straight shaft (standard)	N: End face tap (standard) A: Outer diameter threading B: Inner diameter threading	N: None	N: No surface treatment S: With surface treatment (THK AP-C treatment)	X	N: None	N: None



Shaft End Shape

⑥ Ball screw shaft side	⑦ Ball spline shaft side		
Symbol: M	Symbol: N	Symbol: A	Symbol: B
Straight shaft	End face tap (standard)	Outer diameter threading	Inner diameter threading

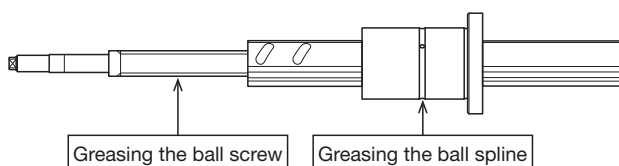
Basic Specifications

DSP	Constant axial load (kN)*	8.4
	Instantaneous axial load (kN)*	16.8
Ball screw	Ball screw lead (mm)	6
	Basic dynamic load rating C_a (kN)	49.3
	Basic static load rating C_0a (kN)	149.4
	Ball screw shaft diameter (mm)	$\phi 32$
	Ball screw shaft thread minor diameter (mm)	$\phi 28.4$
	Ball center-to-center diameter (mm)	$\phi 33$
	Axial clearance (mm)	0.010 max (G1)
	Accuracy grade	C5
	DN value	70000
Ball spline	Basic dynamic load rating C (kN)	60.9
	Basic static load rating C_0 (kN)	94.5
	Ball spline shaft diameter (mm)	$\phi 50$
	Clearance in the rotational direction (mm)	-0.016 to -0.008 (CL: light preload)

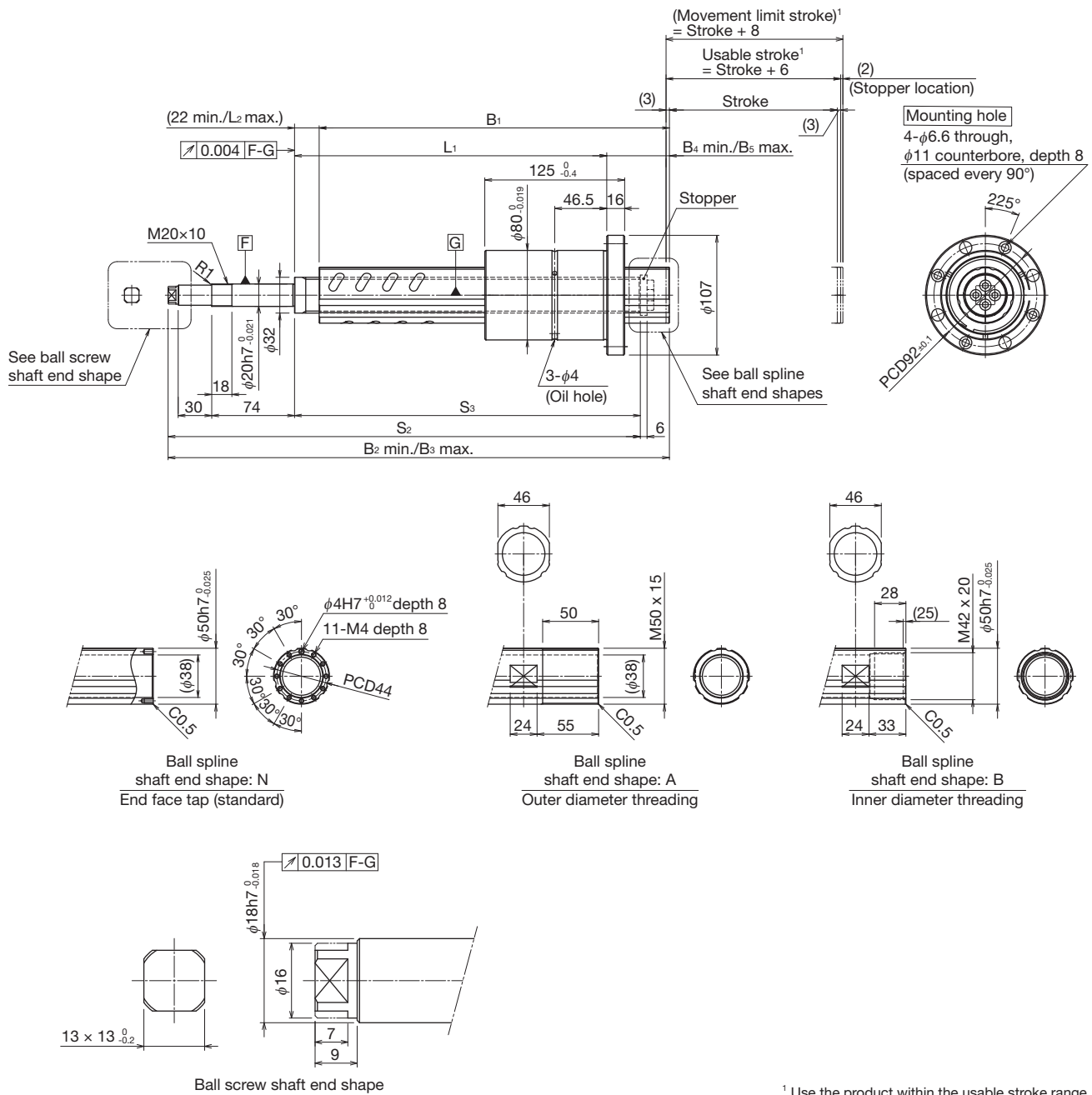
* This value is estimated. Please consider the strength of the mounting part.

Maintenance

For the ball screw, apply grease directly to the screw shaft.
For the ball spline, replenish lubricant from the oil hole of the ball spline nut and apply grease directly to the ball spline shaft.



Dimensions



¹ Use the product within the usable stroke range.

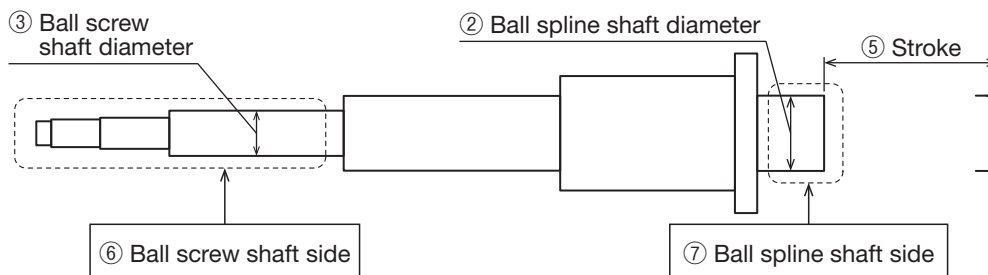
Stroke (mm) (Max. usable stroke)		50 (56)			100 (106)			150 (156)			200 (206)			250 (256)		
Dimensions (mm)	L ₁	179			229			279			329			379		
	L ₂	72			122			172			222			272		
Ball screw shaft dimensions (mm)	S ₂	322			372			422			472			522		
	S ₃	209			259			309			359			409		
Ball spline shaft end shape ²		N	A	B	N	A	B	N	A	B	N	A	B	N	A	B
Ball spline shaft dimensions (mm)	B ₁	213	258	236	263	308	286	313	358	336	363	408	386	413	458	436
	B ₂	348	393	371	398	443	421	448	493	471	498	543	521	548	593	571
	B ₃	398	443	421	498	543	521	598	643	621	698	743	721	798	843	821
	B ₄	56	101	79	56	101	79	56	101	79	56	101	79	56	101	79
	B ₅	106	151	129	156	201	179	206	251	229	256	301	279	306	351	329
Mass (kg)		5.5			6.2			6.8			7.5			8.1		

² Ball spline shaft end shapes: N: End face tap (standard), A: Outer diameter threading, B: Inner diameter threading.

DSP60 3610

Model Number Coding

Model	Ball spline shaft diameter	Ball screw shaft diameter	Ball screw lead	Stroke	Shaft end shape		Options	Customization 1 (Surface treatment)	Customization 2	Customization 3	Customization 4
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
DSP	60	36	10	050	M	N	N	N	X	N	N
DSP	60	36	10	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm	M: Straight shaft (standard)	N: End face tap (standard) A: Outer diameter threading B: Inner diameter threading	N: None	N: No surface treatment S: With surface treatment (THK AP-C treatment)	X	N: None	N: None



Shaft End Shape

⑥ Ball screw shaft side	⑦ Ball spline shaft side		
Symbol: M	Symbol: N	Symbol: A	Symbol: B
Straight shaft	End face tap (standard)	Outer diameter threading	Inner diameter threading

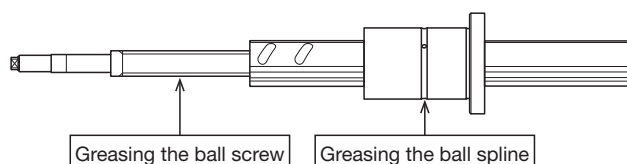
Basic Specifications

DSP	Constant axial load (kN)*	10.9
	Instantaneous axial load (kN)*	21.8
Ball screw	Ball screw lead (mm)	10
	Basic dynamic load rating C_a (kN)	59.5
	Basic static load rating C_0a (kN)	148.7
	Ball screw shaft diameter (mm)	$\phi 36$
	Ball screw shaft thread minor diameter (mm)	$\phi 30.5$
	Ball center-to-center diameter (mm)	$\phi 37.75$
	Axial clearance (mm)	0.010 max (G1)
	Accuracy grade	C5
	DN value	70000
Ball spline	Basic dynamic load rating C (kN)	73.5
	Basic static load rating C_0 (kN)	111.7
	Ball spline shaft diameter (mm)	$\phi 60$
	Clearance in the rotational direction (mm)	-0.022 to -0.012 (CL: light preload)

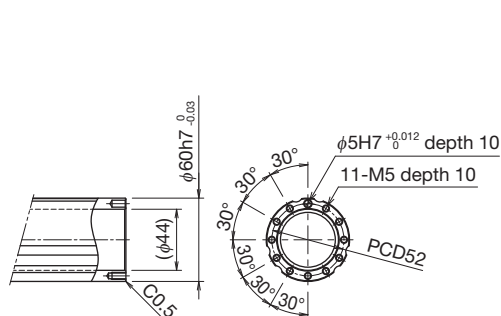
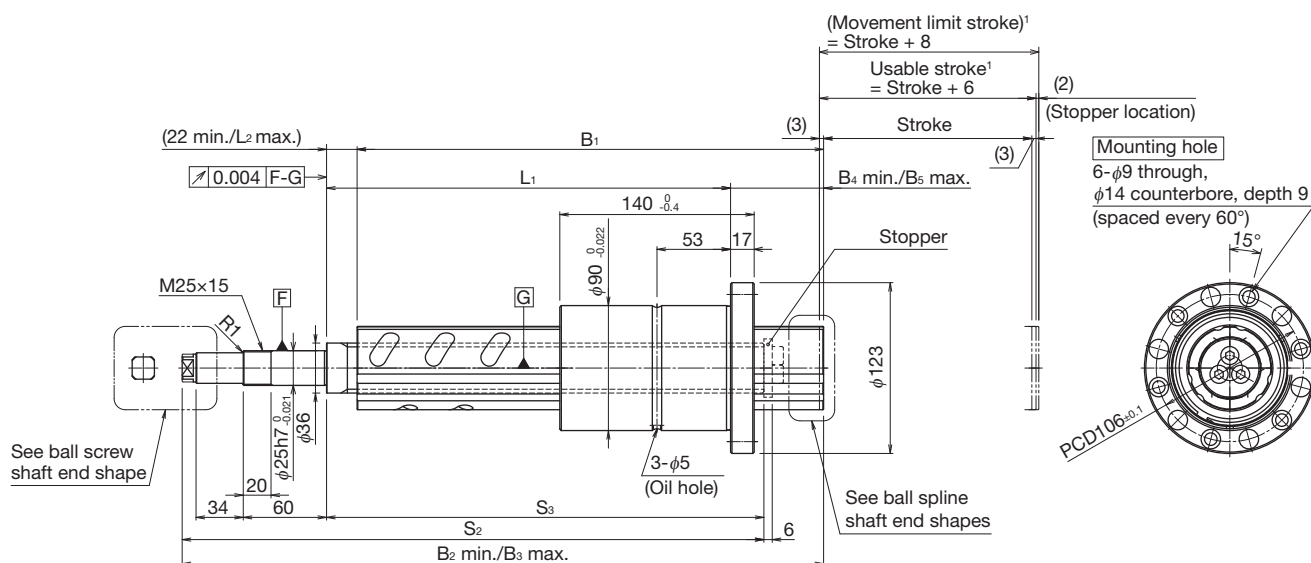
* This value is estimated. Please consider the strength of the mounting part.

Maintenance

For the ball screw, apply grease directly to the screw shaft.
For the ball spline, replenish lubricant from the oil hole of the ball spline nut and apply grease directly to the ball spline shaft.

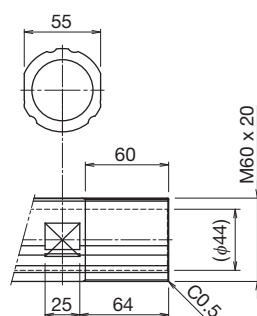


Dimensions

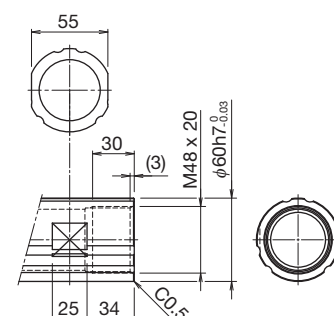


Ball spline
shaft end shape: N

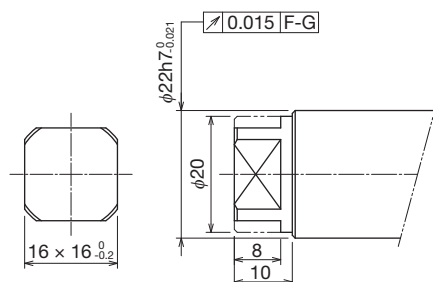
End face tap (standard)



Ball spline
shaft end shape: A
Outer diameter threading



Ball spline
shaft end shape: B
Inner diameter threading



Ball screw shaft end shape

¹ Use the product within the usable stroke range.

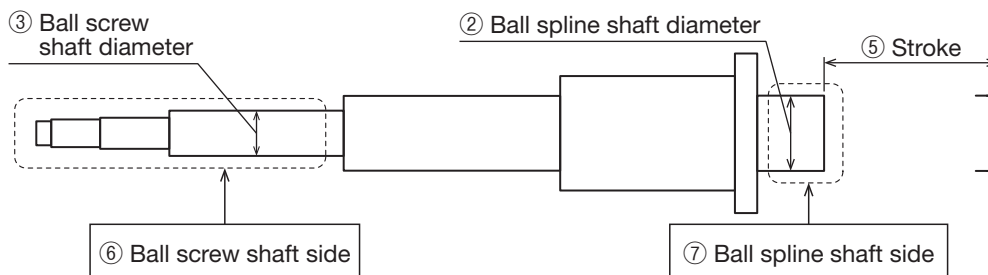
Stroke (mm) (Max. usable stroke)		50 (56)			100 (106)			150 (156)			200 (206)			250 (256)		
Dimensions (mm)	L ₁	191			241			291			341			391		
	L ₂	72			122			172			222			272		
Ball screw shaft dimensions (mm)	S ₂	319			369			419			469			519		
	S ₃	215			265			315			365			415		
Ball spline shaft end shape ²		N	A	B	N	A	B	N	A	B	N	A	B	N	A	B
Ball spline shaft dimensions (mm)	B ₁	236	281	251	286	331	301	336	381	351	386	431	401	436	481	451
	B ₂	362	407	377	412	457	427	462	507	477	512	557	527	562	607	577
	B ₃	412	457	427	512	557	527	612	657	627	712	757	727	812	857	827
	B ₄	67	112	82	67	112	82	67	112	82	67	112	82	67	112	82
	B ₅	117	162	132	167	212	182	217	262	232	267	312	282	317	362	332
Mass (kg)		7.8			8.7			9.6			10.6			11.5		

² Ball spline shaft end shapes: N: End face tap (standard), A: Outer diameter threading, B: Inner diameter threading.

DSP60 3610H

Model Number Coding

Model	Ball spline shaft diameter	Ball screw shaft diameter	Ball screw lead	Stroke	Shaft end shape		Options	Customization 1 (Surface treatment)	Customization 2	Customization 3	Customization 4
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
DSP	60	36	10H	050	M	N	N	N	X	N	N
DSP	60	36	10H	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm	M: Straight shaft (standard)	N: End face tap (standard) A: Outer diameter threading B: Inner diameter threading	N: None	N: No surface treatment S: With surface treatment (THK AP-C treatment)	X	N: None	N: None



Shaft End Shape

⑥ Ball screw shaft side	⑦ Ball spline shaft side		
Symbol: M	Symbol: N	Symbol: A	Symbol: B
Straight shaft	End face tap (standard)	Outer diameter threading	Inner diameter threading

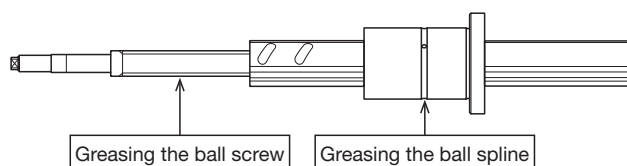
Basic Specifications

DSP	Constant axial load (kN)*	17.8
	Instantaneous axial load (kN)*	35.6
Ball screw	Ball screw lead (mm)	10
	Basic dynamic load rating C_a (kN)	80.9
	Basic static load rating C_0a (kN)	212.5
	Ball screw shaft diameter (mm)	$\phi 36$
	Ball screw shaft thread minor diameter (mm)	$\phi 30.5$
	Ball center-to-center diameter (mm)	$\phi 37.75$
	Axial clearance (mm)	0.010 max (G1)
	Accuracy grade	C5
	DN value	70000
Ball spline	Basic dynamic load rating C (kN)	73.5
	Basic static load rating C_0 (kN)	111.7
	Ball spline shaft diameter (mm)	$\phi 60$
	Clearance in the rotational direction (mm)	-0.022 to -0.012 (CL: light preload)

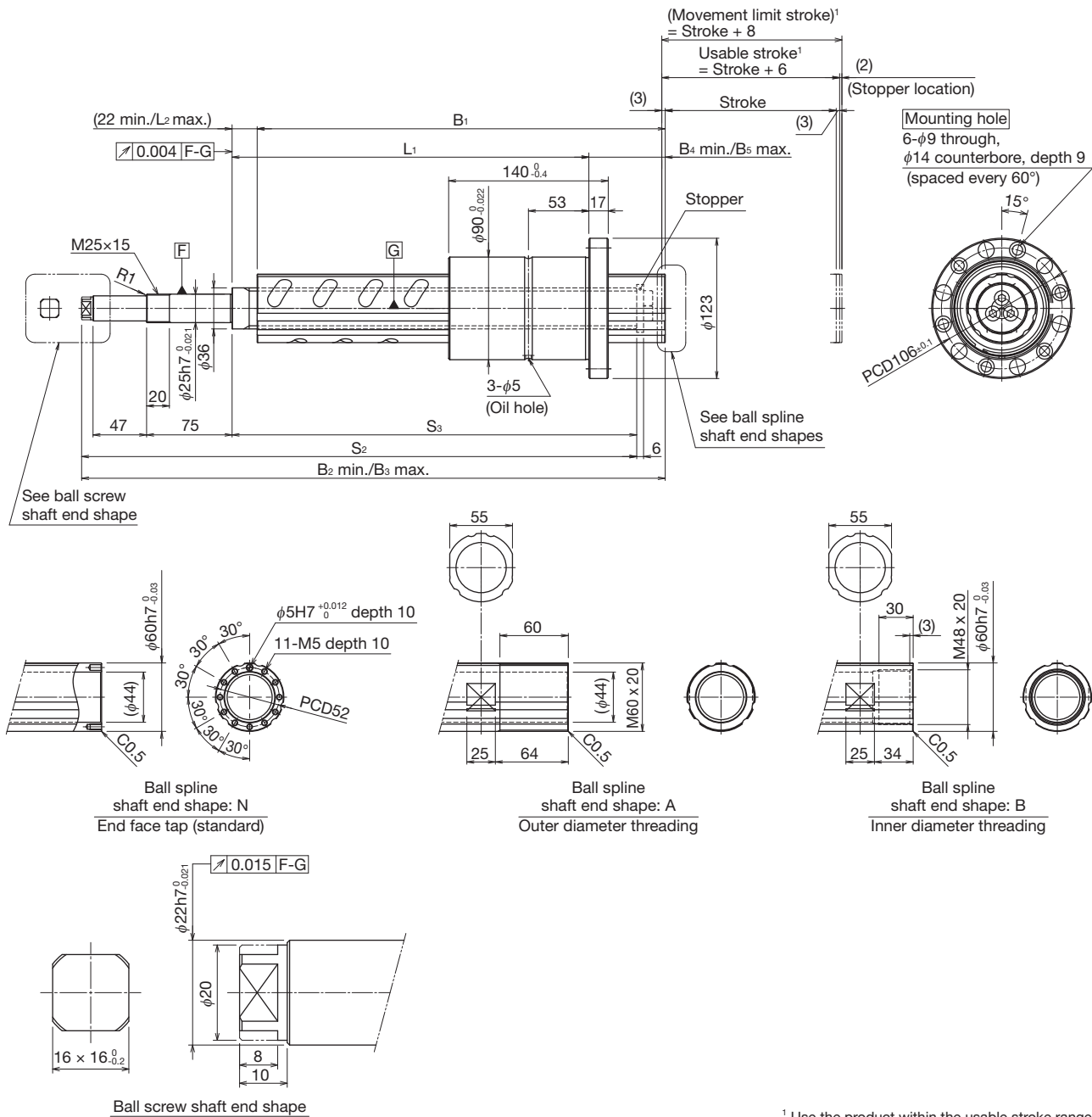
* This value is estimated. Please consider the strength of the mounting part.

Maintenance

For the ball screw, apply grease directly to the screw shaft.
For the ball spline, replenish lubricant from the oil hole of the ball spline nut and apply grease directly to the ball spline shaft.



Dimensions



¹ Use the product within the usable stroke range.

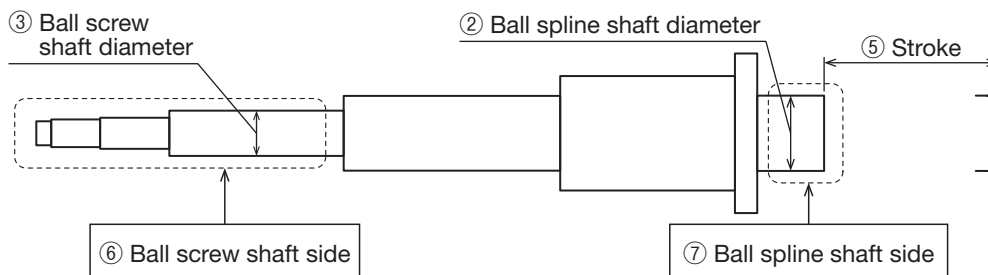
Stroke (mm) (Max. usable stroke)		50 (56)			100 (106)			150 (156)			200 (206)			250 (256)		
Dimensions (mm)	L ₁	213			263			313			363			413		
	L ₂	72			122			172			222			272		
Ball screw shaft dimensions (mm)	S ₂	387			437			487			537			587		
	S ₃	255			305			355			405			455		
Ball spline shaft end shape ²		N	A	B	N	A	B	N	A	B	N	A	B	N	A	B
Ball spline shaft dimensions (mm)	B ₁	258	303	290	308	353	340	358	403	390	408	453	440	458	503	490
	B ₂	412	457	444	462	507	494	512	557	544	562	607	594	612	657	644
	B ₃	462	507	494	562	607	594	662	707	694	762	807	794	862	907	894
	B ₄	67	112	99	67	112	99	67	112	99	67	112	99	67	112	99
	B ₅	117	162	149	167	212	199	217	262	249	267	312	299	317	362	349
Mass (kg)		8.6			9.5			10.4			11.3			12.2		

² Ball spline shaft end shapes: N: End face tap (standard), A: Outer diameter threading, B: Inner diameter threading.

DSP80 5012

Model Number Coding

Model	Ball spline shaft diameter	Ball screw shaft diameter	Ball screw lead	Stroke	Shaft end shape		Options	Customization 1 (Surface treatment)	Customization 2	Customization 3	Customization 4
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
DSP	80	50	12	050	M	N	N	N	X	N	N
DSP	80	50	12	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm	M: Straight shaft (standard)	N: Inner diameter threading (standard) A: Outer diameter threading C: End face tap	N: None	N: No surface treatment S: With surface treatment (THK AP-C treatment)	X	N: None	N: None



Shaft End Shape

⑥ Ball screw shaft side	⑦ Ball spline shaft side		
Symbol: M	Symbol: N	Symbol: A	Symbol: C
Straight shaft	Inner diameter threading (standard)	Outer diameter threading	End face tap

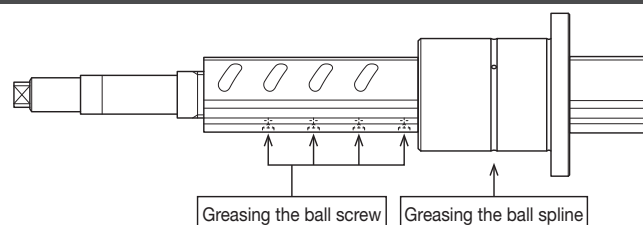
Basic Specifications

DSP	Constant axial load (kN)*	48
	Instantaneous axial load (kN)*	120
Ball screw	Ball screw lead (mm)	12
	Basic dynamic load rating C_a (kN)	150.7
	Basic static load rating C_0a (kN)	451.9
	Ball screw shaft diameter (mm)	$\phi 50$
	Ball screw shaft thread minor diameter (mm)	$\phi 43.3$
	Ball center-to-center diameter (mm)	$\phi 52.25$
	Axial clearance (mm)	0.010 max (G1)
	Accuracy grade	C5
	DN value	70000
Ball spline	Basic dynamic load rating C (kN)	104.9
	Basic static load rating C_0 (kN)	154.8
	Ball spline shaft diameter (mm)	$\phi 80$
	Clearance in the rotational direction (mm)	-0.022 to -0.012 (CL: light preload)

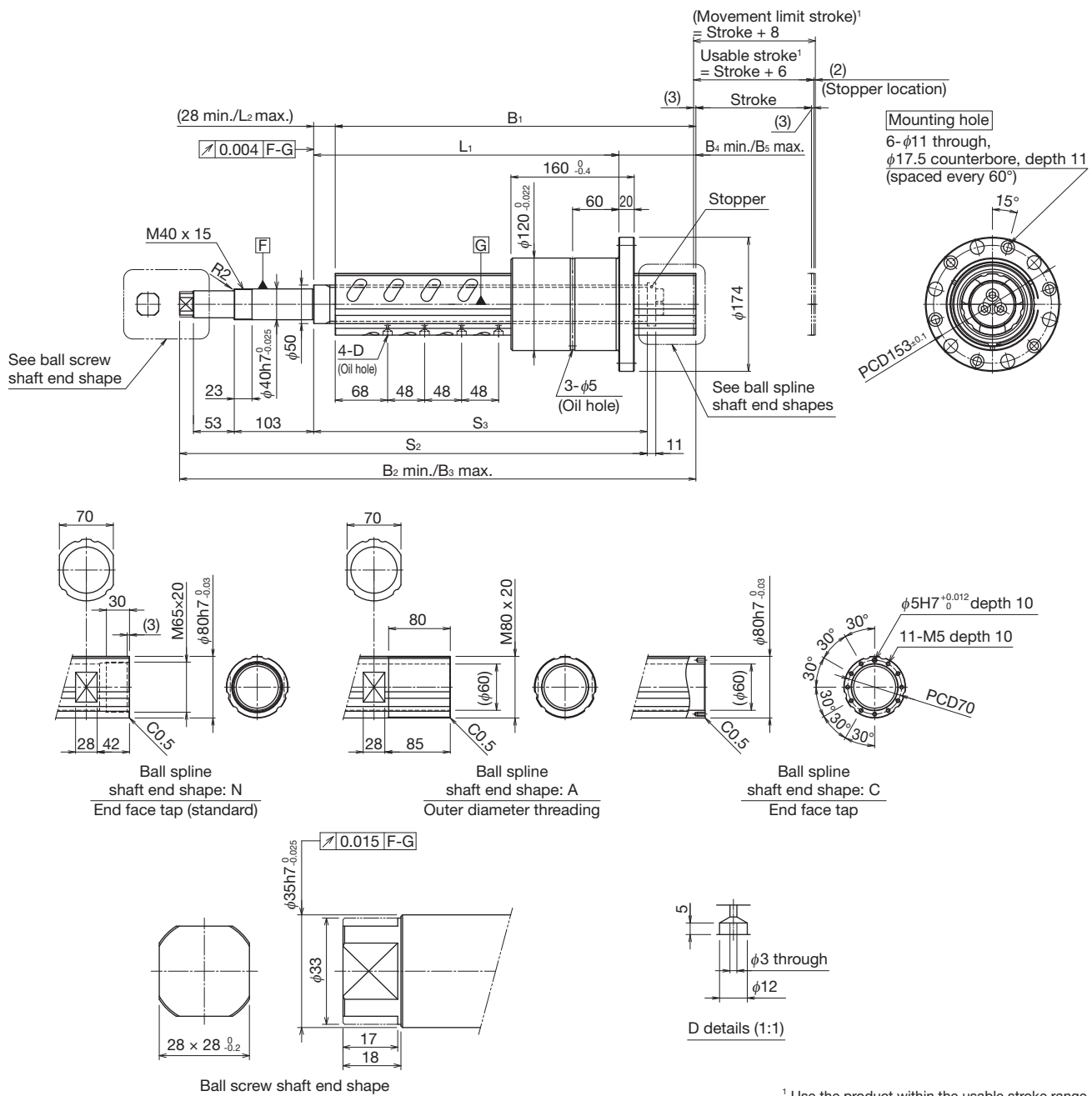
* This value is estimated. Please consider the strength of the mounting part.

Maintenance

For the ball screw, apply grease directly to the screw shaft.
For the ball spline, replenish lubricant from the oil hole of the ball spline nut and apply grease directly to the ball spline shaft.



Dimensions



¹ Use the product within the usable stroke range.

Stroke (mm) (Max. usable stroke)		50 (56)		100 (106)		150 (156)		200 (206)		250 (256)	
Dimensions (mm)	L ₁	296		346		396		446		496	
	L ₂	78		128		178		228		278	
Ball screw shaft dimensions (mm)	S ₂	507		557		607		657		707	
	S ₃	333		383		433		483		533	
Ball spline shaft end shape ²		N/C	A	N/C	A	N/C	A	N/C	A	N/C	A
Ball spline shaft dimensions (mm)	B ₁	368	411	418	461	468	511	518	561	568	611
	B ₂	570	613	620	663	670	713	720	763	770	813
	B ₃	620	663	720	763	820	863	920	963	1020	1063
	B ₄	100	143	100	143	100	143	100	143	100	143
	B ₅	150	193	200	243	250	293	300	343	350	393
Mass (kg)		23.6		25.3		27		28.7		30.4	

² Ball spline shaft end shapes: N: Inner diameter threading (standard), A: Outer diameter threading, C: End face tap.

Surface Treatment

THK AP-C Treatment

AP-C treatment is a type of industrial black chrome plating designed to increase corrosion resistance. It costs less and achieves higher corrosion resistance than martensitic stainless steel.

Technical Materials

Axial Load Estimate

DSP model	DSP301606	DSP402006	DSP402508	DSP503206	DSP603610	DSP603610H	DSP805012
Ball spline shaft diameter (mm)	30	40	40	50	60	60	80
Ball screw shaft diameter (mm)	16	20	25	32	36	36	50
Ball screw lead (mm)	6	6	8	6	10	10	12
Constant axial load (kN)	1.6	3.2	5.6	8.4	10.9	17.8	48
Instantaneous axial load (kN)	3.3	6.4	11.2	16.8	21.8	35.6	120

Note) Strength of mounting part must be considered separately.

Precautions on Use

Handling

- Please use at least two people to move any product weighing 20 kg or more, or use a cart or another method of conveyance. Otherwise, it may cause injury or damage the unit.
- Do not disassemble the parts. This may result in loss of functionality.
- Tilting the screw shaft and nut may cause them to fall under their own weight.
- Take care not to drop or strike this product. Otherwise, it may cause injury or damage the unit. Even if there is no outward indication of damage, a sudden impact could prevent the unit from functioning properly.
- When assembling, be sure not to remove the nut from the screw shaft.
- Wear appropriate safety gear, such as protective gloves and safety shoes, when handling the product.

Precautions on Use

- Prevent foreign materials, such as cutting chips or coolant, from entering the product. Failure to do so could damage the product.
- Prevent foreign materials, such as cutting chips, coolant, corrosive solvents, or water from getting in the product by using a bellows or cover when the product is used in an environment where such a thing is likely.
- The operating temperature range for this product is between -15°C to 80°C (no freezing or condensation).
- If foreign materials such as cutting chips adhere to the product, replenish the lubricant after washing the product.
- Slight oscillations can inhibit the formation of an oil film between the raceways and the area of contact for the balls, resulting in fretting. Therefore, be sure to use a type of grease with high fretting resistance.
We recommend periodically rotating the nut once to help ensure that a film forms between the raceways and balls.
- Do not forcibly drive a pin, key, or other positioning device into the product. This could create indentations in the raceways and impair the product's function.
- Skewing or misalignment of the nut and the element that supports the shaft can drastically reduce service life. Inspect the components carefully and make sure they are mounted correctly.
- If any balls fall out of the nut, contact THK. Do not use the product in that condition.
- If the unit will be mounted vertically, install safety equipment or take other measures to prevent it from falling. The nut may fall under its own weight.
- Do not exceed the permissible rotation speed when using the product. This could damage the product or otherwise cause it to malfunction. Please use the product within the range of speeds we have specified.
- Do not allow the nut to overshoot. The product may malfunction if any of the balls fall out, the circulation components become damaged, or any indentations form in the ball raceways.
Continuing to use the product under these circumstances may lead to premature wear or damage to the circulation components.
- Insufficient rigidity or accuracy of the mounting surface could cause an unexpected load to act on the ball screw, which could lead to premature failure of the product.
Therefore, give sufficient consideration to the rigidity and accuracy of the housing and base.
- Do not touch any moving parts while the product is in operation or in an operable state.
- If performing a task involving multiple people, confirm how to perform the work, what signals will be used, and how to handle problems before beginning, and assign another person to monitor the work.
- A stopper is installed inside the product. It is intended to limit the stroke, and may become damaged in the event of a strong impact.

Lubrication

- Thoroughly wipe off anti-rust oil and feed lubricant before using the product.
- Do not mix different lubricants. Even grease containing the same type of thickening agent may, if mixed, interact negatively due to disparate additives or other ingredients.
- When using the product in locations exposed to constant vibrations or in special environments such as in clean rooms, vacuums, and low/high temperatures, use a lubricant suitable for its use/environment.
- When lubricating products that do not feature a grease nipple or oil hole, directly coat the raceways with lubricant and perform several warm-up strokes to ensure that the grease permeates the interior.
- Grease viscosity can vary depending on the temperature. Please keep in mind that the torque may be affected by changes in viscosity.
- After lubrication, the rotational torque of the DSP may increase due to the stirring resistance of the grease. Be sure to perform a warming-up operation and allow the grease to break in sufficiently before operating the machinery.
- Excess grease may spatter after lubrication. Wipe off spattered grease as necessary.
- Grease deteriorates over time, which decreases the lubricity. Perform regular grease inspections and replenish grease based on frequency of use.
- The greasing interval varies depending on the usage conditions and environment. Grease the system approximately every 500 km of travel distance (6 months). The final greasing interval/amount should be set at the actual machine.
- There is a risk that lubrication may not work sufficiently if the lubricating oil does not circulate due to the mounting orientation or the oiling port of the nut, so be sure to give these factors adequate consideration during design.
- It is necessary to provide adequate lubrication when using the DSP. Using the product without lubrication may increase wear on the rolling elements and shorten the service life.

Storage

- When storing the DSP, pack it as designated by THK and store it indoors in a horizontal position away from high or low temperatures and high humidity.
- Please note that if the product has been kept in storage for an extended period, the lubricant inside may have deteriorated. Please ensure that you replenish the lubricant before using.

Disposal

- The product should be treated as industrial waste and disposed of appropriately.