HIWIN®

Ballscrews

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*The specifications in this catalogue are subject to change without notification

1. Accuracy Grade of *HIWIN* Ballscrews

1.1 International Standard of Accuracy Grade for Ballscrews

Unit : 0.001mm

Grade		0	1	2	3	4	5	6	7	10
e_{300}	ISO, DIN		6		12		23		52	210
	JIS	3.5	5		8		18		50	210
	HIWN	3.5	5	6	8	12	18	23	50	210

1.2 *HIWIN* Accuracy Grade of Precision Ballscrews

Unit : 0.001mm

Accuracy Grade		0		1		2		3		4		5		6	
$e_{2\pi}$		3		4		4		6		8		8		8	
e_{300}		3.5		5		6		8		12		18		23	
Item / Thread length		±E	e	±E	e	±E	e	±E	e	±E	e	±E	e	±E	e
above	below														
-	315	4	3.5	6	5	6	6	12	8	12	12	23	18	23	23
315	400	5	3.5	7	5	7	6	13	10	13	12	25	20	25	25
400	500	6	4	8	5	8	7	15	10	15	13	27	20	27	26
500	630	6	4	9	6	9	7	16	12	16	14	30	23	30	29
630	800	7	5	10	7	10	8	18	13	18	16	35	25	35	31
800	1000	8	6	11	8	11	9	21	15	21	17	40	27	40	35
1000	1250	9	6	13	9	13	10	24	16	24	19	46	30	46	39
1250	1600	11	7	15	10	15	11	29	18	29	22	54	35	54	44
1600	2000			18	11	18	13	35	21	35	25	65	40	65	51
2000	2500			22	13	22	15	41	24	41	29	77	46	77	59
2500	3150			26	15	26	17	50	29	50	34	93	54	93	69
3150	4000			30	18	32	21	60	35	62	41	115	65	115	82
4000	5000							72	41	76	49	140	77	140	99
5000	6300							90	50	100	60	170	93	170	119
6300	8000							110	60	125	75	210	115	210	130
8000	10000											260	140	260	145
10000	12000											320	170	320	180

1.3 Standard Combination of Grade and Axial Play

Unit : 0.001mm

Grade	0	1	2	3	4	5	6
Axial Play	5	5	5	10	15	20	25

2. Design and Selection of *HIWIN* Ballscrews

2.1 *HIWIN* Ballscrew Range

- Diameter: 6~100 mm
- Length: Max 12 Meters
- Accuracy: 3.5μm/ 300mm (JIS 0 Grade)
- Lead: 1~60 mm

2.2 *HIWIN* Standard Ballscrew Spindle and Lead

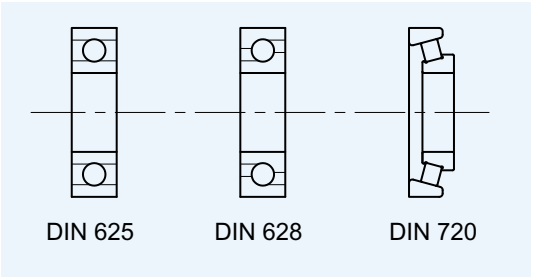
HIWIN recommends the use of our standard ballscrews for your application, but we also offer specialty products such as high lead and miniature ballscrews.

Unit : mm

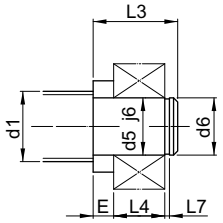
Type	Miniature					Standard								High Lead				Super High Lead						
lead / dia.	1	1.5	2	2.5	3	3.175	4	4.23	5	5.08	6	6.35	8	10	12	12.7	16	20	24	25	25.4	32	40	50
6	G	G	G																					
8	G	G	G	G									G											
10	G	G	G	G			G							G										
12		G	G	G			G		G					G										
15														G				G						
16			G	G			G		G	G			G	G			G					G		
20			G	G			G		G	G	G			G			G	G					G	
22									G	G														
25				G			G		G	G	G	G	G	G		G	G	G		G				G
28								G	G	G	G	G		G										
32						G	G		G	G	G	G	G	G	G	G		G		G	G	G		
36									G		G		G	G	G									
40				G	G		G		G	G	G	G	G	G	G	G	G	G		G			G	G
45									G	G				G	G									
50									G	G	G	G	G	G	G	G		G		G			G	G
55													G	G	G	G								
63												G	G	G	G	G	G	G			G		G	G
70														G	G				G					
80														G	G	G	G	G						
100															G		G	G						

*G : Precision ground grade ballscrews, either left or right hand screws are available.

2.3 Spindle End and Journal Configuration



(I)



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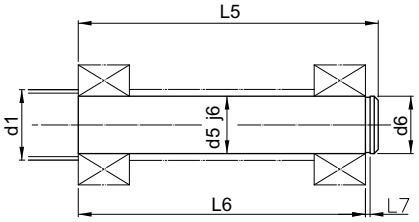

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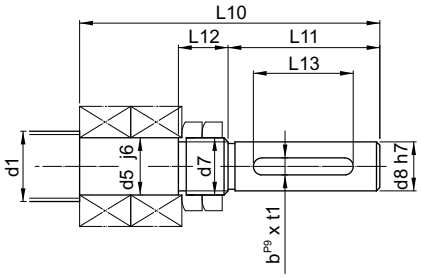

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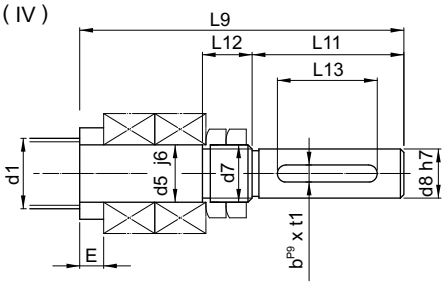

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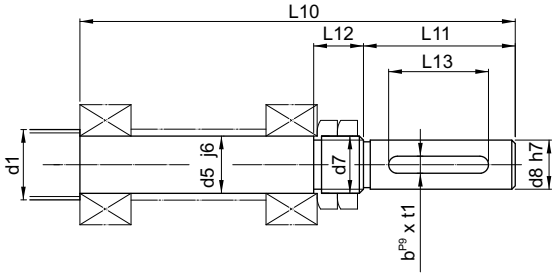


2.4 Dimension for Spindle End

Model	d1	d5	d6	d7	d8	E	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	bxt1	Recommended Bearing	
																			I.II.III DIN625	III.IV.V DIN625 628 720
10	10	8	7.6	M8x0.75	6	6	16	7	29	26	0.9	39	50	56	18	10	12	3.0x1.8	608	738B
12	12	8	7.6	M8x0.75	6	6	16	7	29	26	0.9	39	50	56	18	10	12	3.0x1.8	608	738B
14	14	10	9.6	M10x0.75	8	8	20	9	37	34	1.15	45	54	62	20	10	14	3.0x1.8	6200	7200BTVP
16	16	12	11.5	M12x1	10	8	21	10	41	38	1.15	46	56	66	20	10	14	4.0x2.5	6201	7301BTVP
20	20	15	14.3	M15x1	12	-	22	11	47	44	1.15	55	70	84	25	13	16	5.0x3.0	6202	7202BTVP
25	25	17	16.2	M17x1	15	-	23	12	49	46	1.15	56	72	86	25	13	16	5.0x3.0	6203	7203BTVP
28	28	20	19	M20x1	16	-	26	14	58	54	1.35	68	82	100	28	20	18	6.0x3.5	6204	7602020TVP
32	32	25	23.9	M25x1.5	20	-	27	15	64	60	1.35	79	94	116	36	22	26	7.0x4.0	6205	7602025TVP
36	36	25	23.9	M25x1.5	20	-	27	15	64	60	1.35	79	94	116	36	22	26	7.0x4.0	6205	7602025TVP
40	40	30	28.6	M30x1.5	25	-	28	16	68	64	1.65	86	102	126	42	22	32	8.0x4.0	6206	7602030TVP
45	45	35	33.3	M35x1.5	30	-	29	17	80	76	1.65	97	114	148	50	24	40	10.0x5.0	6207	7602035TVP
50	50	40	38	M40x1.5	35	-	36	23	93	88	1.95	113	126	160	60	24	45	12.0x5.0	6308	7602040TVP
55	55	45	42.5	M45x1.5	40	-	38	25	93	88	1.95	125	138	168	70	24	50	14.0x5.5	6309	7602045TVP
63	63	50	47	M50x1.5	45	-	33	27	102	97	2.2	140	153	188	80	27	60	14.0x5.5	6310	7602050TVP
70	70	55	52	M55x2.0	50	10	44	29	118	113	2.2	154	167	212	90	27	70	16.0x6.0	6311	7602055TVP
80	80	65	62	M65x2.0	60	10	49	33	132	126	2.7	171	184	234	100	30	80	18.0x7.0	6313	7602065TVP
100	100	75	72	M75x2.0	70	10	53	37	140	134	2.7	195	208	258	120	30	90	20.0x7.5	6315	7602075TVP

* We reserve the right to modify and improve value without prior notice.
* Different diameters and leads are available upon request.

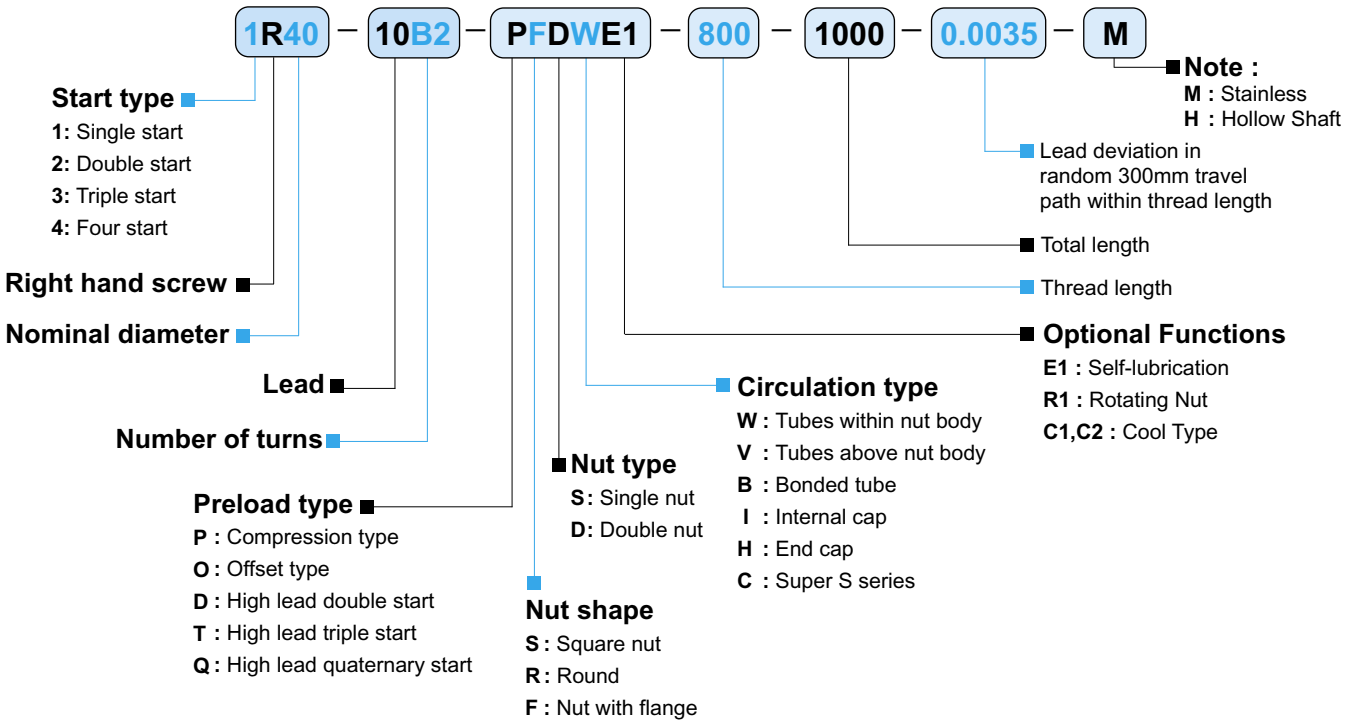
2.5 How to Order *HIWIN* Ballscrews

HIWIN manufactures ballscrews according to customer specifications. Please complete the ***HIWIN*** questionnaire (on page 54) and provide the following information needed for designing the ballscrew.

1. Nominal diameter.
2. Thread lead.
3. Thread length, total length.
4. End journal configuration.
5. Nut configuration (see 3-1, 4-3)
6. Accuracy grade (lead deviation, geometrical tolerance).
7. Working speed.
8. Maximum static load, working load, preload drag torque.
9. Nut safety requirements.
10. Lubrication hole position.

HIWIN Ballscrew Nomenclature

HIWIN **ballscrews can be specified as follows:**



Turns per circuit

A : 1.5 turns	U : 2.8 turns
B : 2.5 turns	S : 1.8 turns
C : 3.5 turns	V : 0.7 turns
T : 1.0 turn	K : 1.0 turn

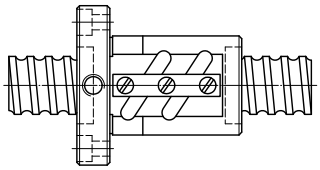
Note : 1. Different diameters and leads are available upon request.
2. Right hand thread is standard, left hand thread is available upon request.
3. Longer lengths are available upon request.
4. Stainless steel is available upon request, only if the ball size is less than 2.381 mm.
5. Complete questionnaire on page 121~122 and consult with ***HIWIN*** engineers.
6. If you need to order DIN 69051 type, please mark “DIN”.
7. Number of turns = Turns per circuit X Number of circuits
Ex. B2 signify 2.5 (turns) x 2 (circuits)

3. HIWIN Precision Ground Ballscrews

3.1 Precision Ground Ballscrew Series

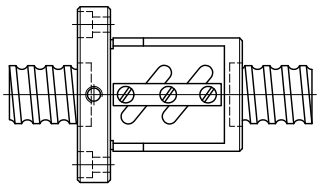
General Type

★★ **FSV**



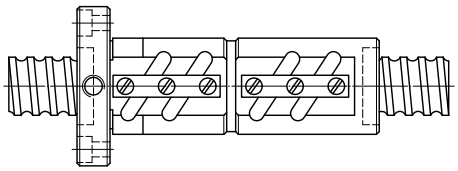
(F) Flange end **(S)** Single nut,
(V) Tube above the nut diameter

★★ **FSW**



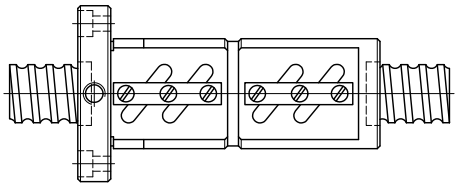
(F) Flange end **(S)** Single nut
(W) Tube within the nut diameter

★★ **FDV**



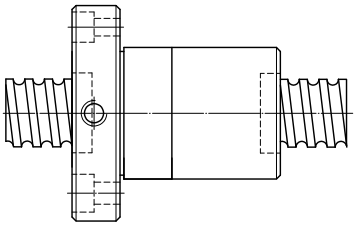
(F) Flange end **(S)** Double nut
(V) Tube above the nut diameter

★★ **FDW**



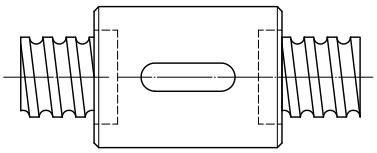
(F) Flange end **(D)** Double nut
(W) Tube within the nut diameter

★★ **FSI**



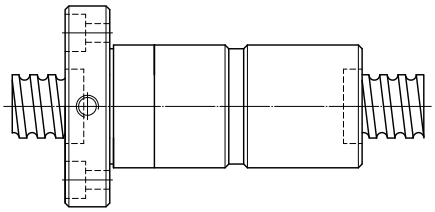
(F) Flange end **(S)** Single nut
(I) Internal recirculation cap

RSI



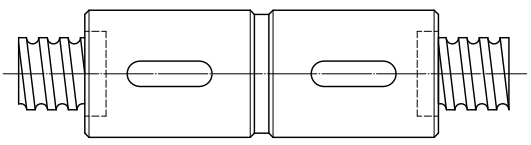
(R) Round **(S)** Single nut
(I) Internal recirculation cap

★★ **FDI**



(F) Flange end **(S)** Double nut
(I) Internal recirculation cap

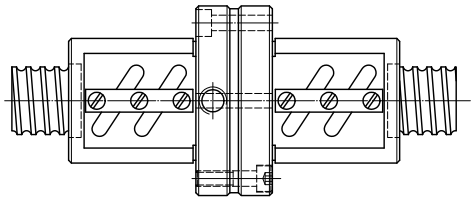
RDI



(R) Round **(D)** Double nut
(I) Internal recirculation cap

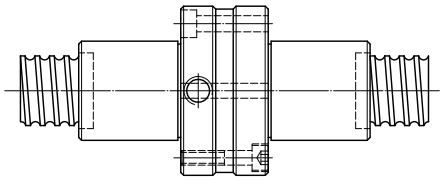
General Type

PFDW -Type 1



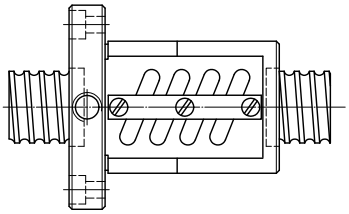
(PF) Flange to flange (D) Double nut
(W)Tube within the nut diameter

PFDI



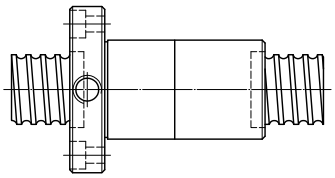
(PF) Flange to flange (D) Double nut
(I) Internal recirculation Cap

OFSW



(O) Offset pitch preload (F) Flange end
(S) Single nut (W) Tube within the nut diameter

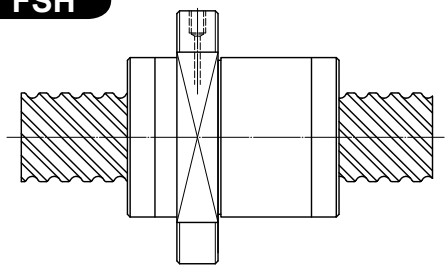
OFSI



(O) Offset pitch preload (F) Flange end
(S) Single nut (I) Internal recirculation cap

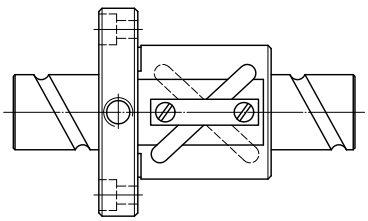
High Lead Type

FSH



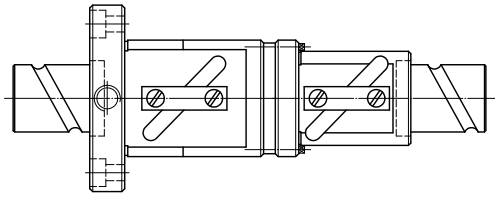
Large lead (F) Flange mounted
(S) Single nut (H) End cap

DFSV



(D) Double start (F) Flange end
(S) Single nut (V) Tube above the nut diameter

PFDW -Type 2

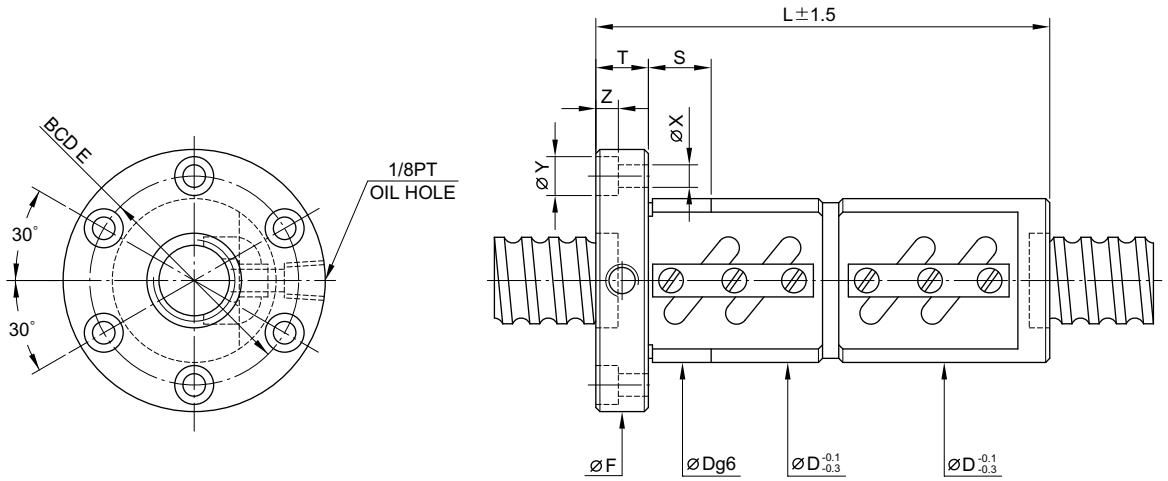


Large lead (PF) Flange end, Compression preload
(D) Double nut (W) Tube within nut diameter

* Different design required by the drawing approval, please contact with *HIWIN* engineers for the other type listed above.
* Double asterisks(★★): Self-Lubricating Ballscrew E1 design is available, except the shaft diameter under 16mm or ball diameter under 2.381mm.

3.2 Dimensions for *HIWIN* Precision Ground Ballscrews

FDW TYPE — Standard

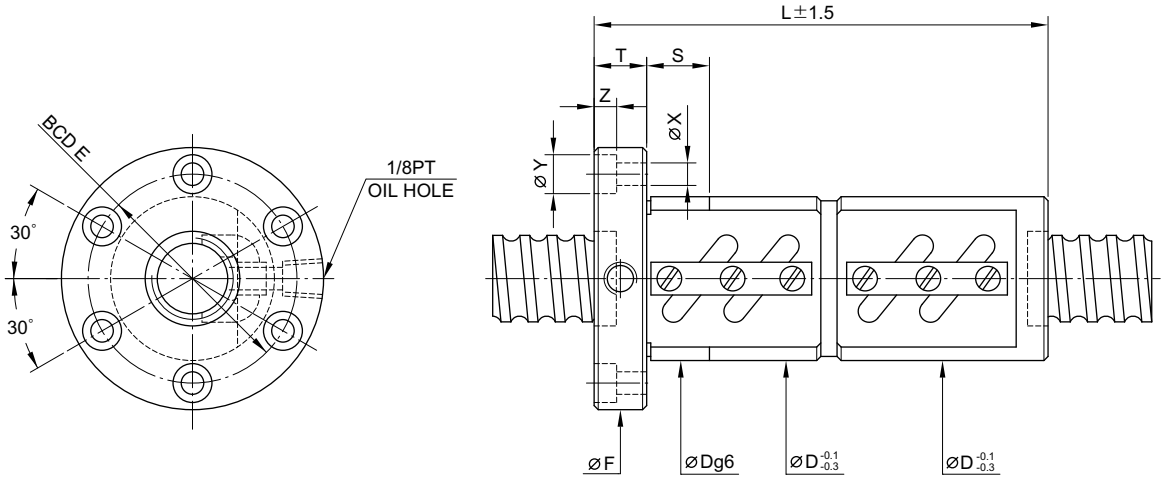


Model	Size		Ball Dia.	Circuits	Stiffness kgf / µm K	Dynamic Load 1x10⁶ revs C (kgf)	Static Load Co (kgf)	Nut		Flange			Bolt			Fit
	Nominal Dia.	Lead						D	L	F	T	BCD-E	X	Y	Z	S
16-5B2	16	5	3.175	2.5x2	65	1385	2799	40	110	64	12	51	5.5	9.5	5.5	24
16-5B1				2.5x1	32	763	1400	40	80	64	12	51	5.5	9.5	5.5	24
16-5C1				3.5x1	46	1013	1946	40	90	64	12	51	5.5	9.5	5.5	24
20-5B1	20			2.5x1	38	837	1733	44	80	68	12	55	5.5	9.5	5.5	24
20-5B2				2.5x2	76	1519	3465	44	110	68	12	55	5.5	9.5	5.5	24
20-6B1		6	3.969	2.5x1	40	1139	2187	48	92	72	12	59	5.5	9.5	5.5	24
20-6C1				3.5x1	55	1512	3041	48	104	72	12	59	5.5	9.5	5.5	24
25-5A2	25	5	3.175	1.5x2	54	1092	2622	50	102	73	11	61	5.5	9.5	5.5	24
25-5B1				2.5x1	46	939	2209	50	80	74	12	62	5.5	9.5	5.5	24
25-5B2				2.5x2	90	1704	4417	50	110	74	12	62	5.5	9.5	5.5	24
25-5C1				3.5x1	68	1252	3085	50	90	74	12	62	5.5	9.5	5.5	24
25-6B2		6	3.969	2.5x2	94	2304	5524	56	128	82	12	69	6.6	11	6.5	24
25-6C1				3.5x1	66	1690	3844	56	104	82	12	69	6.6	11	6.5	24
25-10B1		10	4.763	2.5x1	48	1592	3237	60	122	86	16	73	6.6	11	6.5	24
28-5B1	28	5	3.175	2.5x1	51	984	2466	55	80	85	12	69	6.6	11	6.5	24
28-5B2				2.5x2	98	1785	4932	55	110	85	12	69	6.6	11	6.5	24
28-6A2		6		1.5x2	59	1150	2960	55	110	85	12	69	6.6	11	6.5	24
28-6B2				2.5x2	98	1776	4980	55	123	85	12	69	6.6	11	6.5	24
32-4B2	32	4	2.381	2.5x2	91	1071	3582	54	93	81	12	67	6.6	11	6.5	24
32-5B1		5	3.175	2.5x1	55	1039	2833	58	80	84	12	71	6.6	11	6.5	24
32-5B2				2.5x2	109	1886	5666	58	110	84	12	71	6.6	11	6.5	24
32-5C1				3.5x1	76	1388	3967	58	90	84	12	71	6.6	11	6.5	24
32-6B1		6	3.969	2.5x1	57	1409	3510	62	92	88	12	75	6.6	11	6.5	24
32-6B2				2.5x2	112	2556	7020	62	128	88	12	75	6.6	11	6.5	24
32-6C1				3.5x1	78	1888	4936	62	104	88	12	75	6.6	11	6.5	24
32-8A2		8	4.763	1.5x2	70	2082	5151	66	135	100	15	82	9	14	8.5	30
32-8B1				2.5x1	58	1810	4227	66	110	100	16	82	9	14	8.5	30
32-8B2				2.5x2	115	3284	8453	66	158	100	16	82	9	14	8.5	30
32-8B3				2.5x3	168	4653	12678	74	205	108	16	90	9	14	8.5	30
32-8C1				3.5x1	82	2428	5948	66	126	100	16	82	9	14	8.5	30
32-10A2		10	6.350	1.5x2	72	3051	6612	74	167	108	15	90	9	14	8.5	30
32-10B1				2.5x1	58	2651	5600	74	122	108	16	90	9	14	8.5	30
32-10B2				2.5x2	118	4810	11199	74	182	108	16	90	9	14	8.5	30
32-10C1				3.5x1	86	3519	7785	74	142	108	16	90	9	14	8.5	30
32-12B1		12		2.5x1	62	2602	5510	74	153	108	18	90	9	14	8.5	30
32-12B2				2.5x2	118	4810	11199	74	232	108	16	90	9	14	8.5	30
32-12C1				3.5x1	84	3518	7784	74	166	108	16	90	9	14	8.5	30

Remark : Stiffness values listed above are derived from theoretical formula to the elastic deformation between balltrack and balls while preload is 10% of dynamic load rating and axial load is applied.

FDW TYPE

Standard

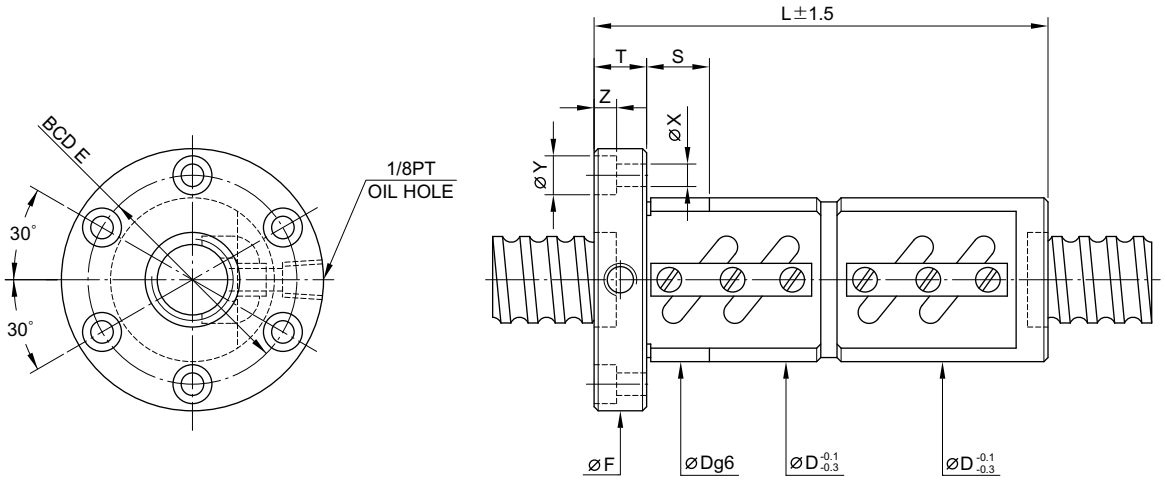


Model	Size		Ball Dia.	Circuits	Stiffness kgf / μm K	Dynamic Load 1x10⁶ revs C (kgf)	Static Load Co (kgf)	Nut		Flange			Bolt			Fit
	Nominal Dia.	Lead						D	L	F	T	BCD-E	X	Y	Z	S
36-6B1	36	6	3.969	2.5x1	62	1486	3969	65	92	100	12	82	6.6	11	6.5	24
36-6B2				2.5x2	121	2696	7937	65	128	100	12	82	6.6	11	6.5	24
36-12A2		12	4.763	1.5x2	80	2557	6693	70	155	108	15	90	9	14	8.5	30
36-12B1			6.350	2.5x1	67	2812	6334	75	126	120	16	98	11	17.5	11	30
36-10B2		10		2.5x2	132	5105	12669	75	184	120	18	98	11	17.5	11	30
36-12B2		12		2.5x2	130	5105	12668	75	206	120	18	98	11	17.5	11	30
36-8A2		8	4.763	1.5x2	77	2217	5669	70	135	108	15	90	9	14	8.5	30
36-8B2				2.5x2	126	3489	9606	70	158	108	15	90	9	14	8.5	30
40-5B1	40	5	3.175	2.5x1	65	1141	3567	68	84	102	16	84	9	14	8.5	30
40-5B2				2.5x2	132	2071	7134	68	114	102	16	84	9	14	8.5	30
40-6B2		6	3.969	2.5x2	136	2817	8855	70	132	104	16	86	9	14	8.5	30
40-8B1		8	4.763	2.5x1	69	2003	5302	74	110	108	16	90	9	14	8.5	30
40-8B2				2.5x2	137	3634	10603	74	158	108	16	90	9	14	8.5	30
40-8B3				2.5x3	200	5150	15904	74	210	108	15	90	9	14	8.5	30
40-8C1				3.5x1	96	2679	7438	74	126	108	16	90	9	14	8.5	30
40-10A2		10	6.350	1.5x2	87	3418	8398	82	170	124	18	102	11	17.5	11	30
40-10B1				2.5x1	72	2959	7069	84	132	125	18	104	11	17.5	11	30
40-10B2				2.5x2	145	5370	14138	84	192	125	18	104	11	17.5	11	30
40-10C1				3.5x1	102	3932	9841	84	152	125	18	104	11	17.5	11	30
40-12A2		12	7.144	1.5x2	88	4006	9404	86	160	128	18	106	11	17.5	11	30
40-12B1				2.5x1	70	3425	7837	86	153	128	18	106	11	17.5	11	40
40-12B2				2.5x2	141	6217	15674	86	225	128	18	106	11	17.5	11	40
40-12C1				3.5x1	103	4637	11146	86	179	128	18	106	11	17.5	11	30
40-16A2		16		1.5x2	83	4007	9405	86	214	128	18	106	11	17.5	11	40
40-16B1				2.5x1	72	3425	7837	86	182	128	18	106	11	17.5	11	40
40-16B2				2.5x2	143	6216	15674	86	272	128	22	106	11	17.5	11	30
45-10B1	45	10	6.350	2.5x1	76	3111	7953	88	134	132	18	110	11	17.5	11	30
45-10B2				2.5x2	156	5655	15905	88	194	132	18	110	11	17.5	11	30
45-12B2		12	7.938	2.5x2	162	7627	19799	96	230	142	22	117	13	20	13	40
45-16B2		16	7.144	2.5x2	158	6636	17895	90	278	132	18	110	11	17.5	11	30
50-5A2	50	5	3.175	1.5x2	96	1447	5382	80	107	114	16	96	9	14	8.5	30
50-5A3				1.5x3	143	2051	8072	80	127	114	16	96	9	14	8.5	30
50-6B2		6	3.969	2.5x2	161	3093	11149	84	134	118	16	100	9	14	8.5	30
50-6B3				2.5x3	235	4384	16723	84	170	118	16	100	9	14	8.5	30
50-8B1		8	4.763	2.5x1	81	2206	6705	87	112	128	18	107	11	17.5	11	30
50-8B2				2.5x2	165	4004	13409	87	160	128	18	107	11	17.5	11	30
50-8B3				2.5x3	244	5674	20114	87	208	128	18	107	11	17.5	11	30
50-10B1		10	6.350	2.5x1	88	3245	8918	93	133	135	18	113	11	17.5	11	30

Remark : Stiffness values listed above are derived from theoretical formula to the elastic deformation between balltrack and balls while preload is 10% of dynamic load rating and axial load is applied.

FDW TYPE

Standard

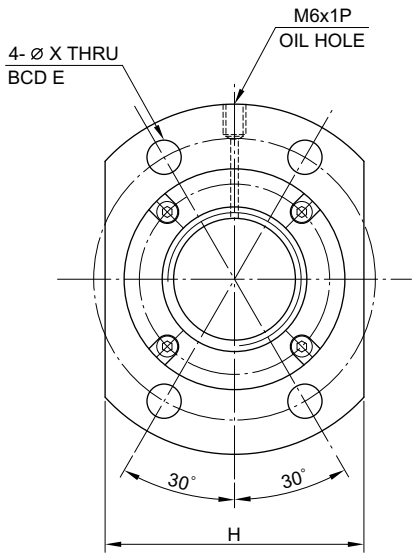


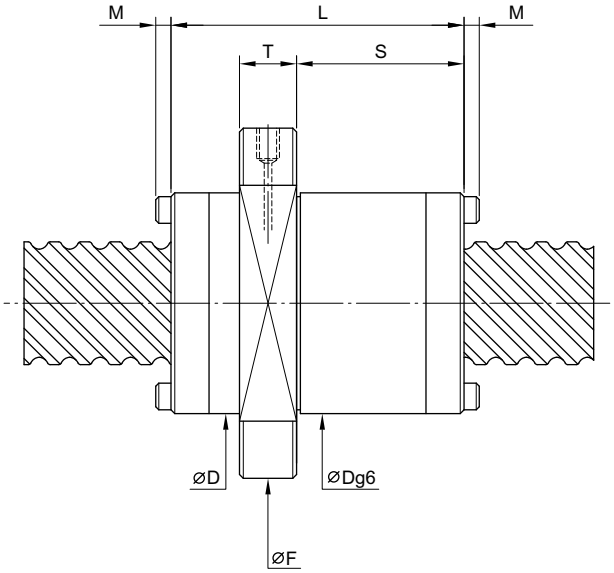
Model	Size		Ball Dia.	Circuits	Stiffness kgf / μm K	Dynamic Load 1x10⁶ revs C (kgf)	Static Load Co (kgf)	Nut		Flange			Bolt			Fit
	Nominal Dia.	Lead						D	L	F	T	BCD-E	X	Y	Z	S
50-10B2	50	10	6.350	2.5x2	173	5923	17670	94	194	135	18	114	11	17.5	11	30
50-10B3				2.5x3	255	8394	26505	94	254	135	18	114	11	17.5	11	30
50-10C1				3.5x1	120	4393	12481	94	154	135	18	114	11	17.5	11	30
50-12B1		12	7.938	2.5x1	90	4367	10918	100	159	146	22	122	14	20	13	40
50-12B2				2.5x2	178	8022	22094	102	232	150	22	125	13	20	13	40
50-12C1				3.5x1	123	5875	15380	102	184	150	22	125	13	20	13	40
50-16B2		16		2.5x2	174	7918	21837	100	280	146	22	122	14	20	13	40
50-20B1		20		2.5x1	90	4367	10918	100	227	146	28	122	14	20	13	40
55-10C1	55	10	6.350	3.5x1	132	4562	13661	100	154	140	18	118	11	17.5	11	40
55-12B2		12	7.938	2.5x2	185	8392	24390	105	232	154	22	127	13	20	13	40
63-8A2	63	8	4.763	1.5x2	107	2826	10129	104	142	146	18	124	11	17.5	11	40
63-8A3				1.5x3	154	4004	15193	104	174	146	18	124	11	17.5	11	40
63-10B2		10	6.350	2.5x2	206	6533	22371	110	196	152	20	130	11	17.5	11	30
63-10B3				2.5x3	305	9258	33556	110	256	152	20	130	11	17.5	11	30
63-12B2		12	7.938	2.5x2	214	8943	28062	118	232	166	22	141	13	20	13	40
63-16B2		16	9.525	2.5x2	280	14862	46009	124	296	172	22	147	13	20	13	40
63-20B2		20		2.5x2	280	14862	46009	124	334	172	22	147	13	20	13	40
70-10B2	70	10	6.350	2.5x2	228	6843	25011	124	196	170	20	145	13	20	13	40
70-10B3				2.5x3	334	9698	37516	124	256	170	20	145	13	20	13	40
70-12B2		12	7.938	2.5x2	236	9382	31275	130	232	178	22	152	13	20	13	40
70-12B3				2.5x3	336	13296	46912	130	302	178	22	152	13	20	13	40
70-20B2		20	9.525	2.5x2	300	15644	51502	130	325	186	28	158	18	26	17.5	60
80-10B2	80	10	6.350	2.5x2	251	7202	28538	130	200	178	22	152	13	20	13	40
80-10B3				2.5x3	368	10207	42807	130	260	178	22	152	13	20	13	40
80-12B2		12	7.938	2.5x2	257	9797	35422	136	232	185	22	159	13	20	13	40
80-12B3				2.5x3	380	13884	53132	136	302	185	22	159	13	20	13	40
80-16B2		16	9.525	2.5x2	340	16485	58851	145	302	210	28	174	18	26	17.5	50
80-16B3				2.5x3	498	23363	88276	145	398	210	28	174	18	26	17.5	50
80-20B2		20		2.5x2	338	16485	58851	145	345	210	28	174	18	26	17.5	50
80-20B3				2.5x3	498	23363	88276	145	470	210	28	174	18	26	17.5	50
100-12B2	100	12	7.938	2.5x2	301	10761	44596	160	240	224	28	188	18	26	17.5	50
100-12B3				2.5x3	452	15251	66894	160	312	224	28	188	18	26	17.5	50
100-16B2		16	9.525	2.5x2	400	18123	74425	170	308	248	32	205	22	32	21.5	60
100-16B3				2.5x3	595	25684	11637	170	404	248	32	205	22	32	21.5	60
100-20B2		20		2.5x2	400	18123	74425	170	350	248	32	205	22	32	21.5	60
100-20B3				2.5x3	595	25684	11637	170	475	248	32	205	22	32	21.5	60

Remark : Stiffness values listed above are derived from theoretical formula to the elastic deformation between balltrack and balls while preload is 10% of dynamic load rating and axial load is applied.

FSH TYPE

Standard



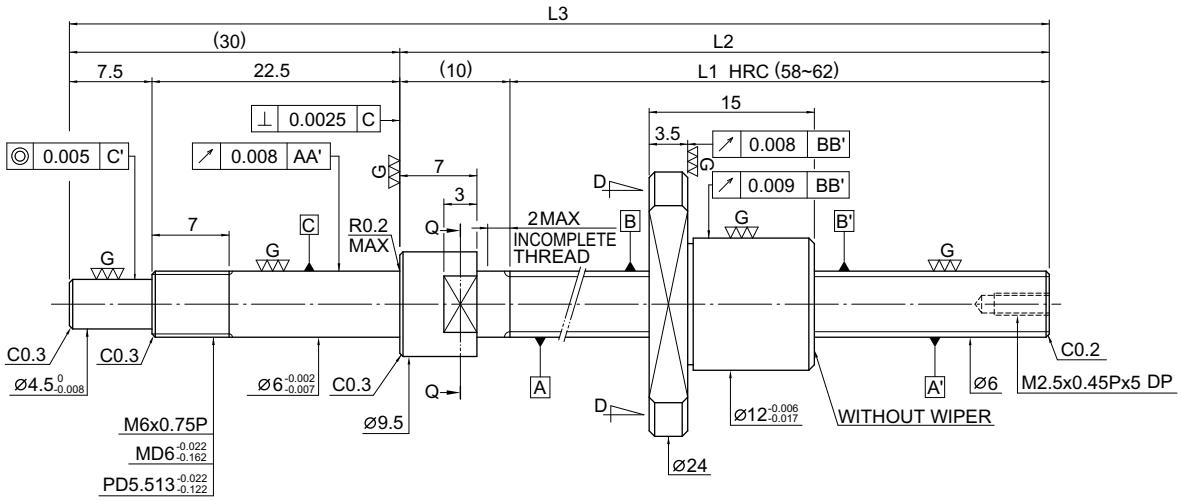


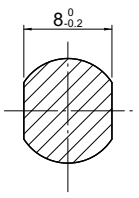
Model	Size		Ball Dia.	Circuits	Stiffness kgf / μm K	Dynamic Load 1x10⁶ revs C (kgf)	Static Load Co (kgf)	Nut		Flange				Bolt	Fit	
	Nominal Dia.	Lead						D	L	F	T	BCD-E	H	X	S	M
15-20S1	15	20	3.175	1.8x1	18	543	917	34	45	55	10	45	36	5.5	24	0
16-16S2	16	16		1.8x2	35	860	1690	32	48	53	10	42	38	4.5	26	0
16-16S4				1.8x4	68	1570	3370									
16-16S2				1.8x2	35	860	1690	33	48	58	10	45	38	6.6	26	0
16-16S4				1.8x4	68	1570	3370									
20-20S2	20	20		1.8x2	42	970	2120	39	48	62	10	50	46	5.5	27.5	0
20-20S2				1.8x2	42	970	2120	38	58	62	10	50	46	5.5	32.5	3
20-20S4				1.8x4	81	1760	4240									
25-25S2	25	25	3.969	1.8x2	53	1470	3410	47	67	74	12	60	56	6.6	39.5	3
25-25S4				1.8x4	105	2670	6830									
32-32S2	32	32	4..762	1.8x2	66	2090	5200	58	85	92	15	74	68	9	48	0
32-32S4				1.8x4	128	3800	10400									
40-40S2	40	40	6.350	1.8x2	82	3420	8740	72	102	114	17	93	84	11	60	0
40-40S4				1.8x4	159	6220	17480									
50-50S2	50	50	7.938	1.8x2	100	5030	13280	90	125	135	20	112	104	14	83.5	0
50-50S4				1.8x4	193	9110	26560									

Remark : Stiffness values listed above are derived from theoretical formula to the elastic deformation between balltrack and balls while preload is 5% of dynamic load rating and axial load is applied.

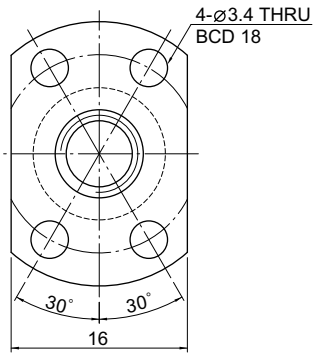
3.3 Dimensions for *HIWIN* Miniature Ground Ballscrews

FSI TYPE (Shaft OD 6, Lead 1.0) Miniature





Q-Q SECTION



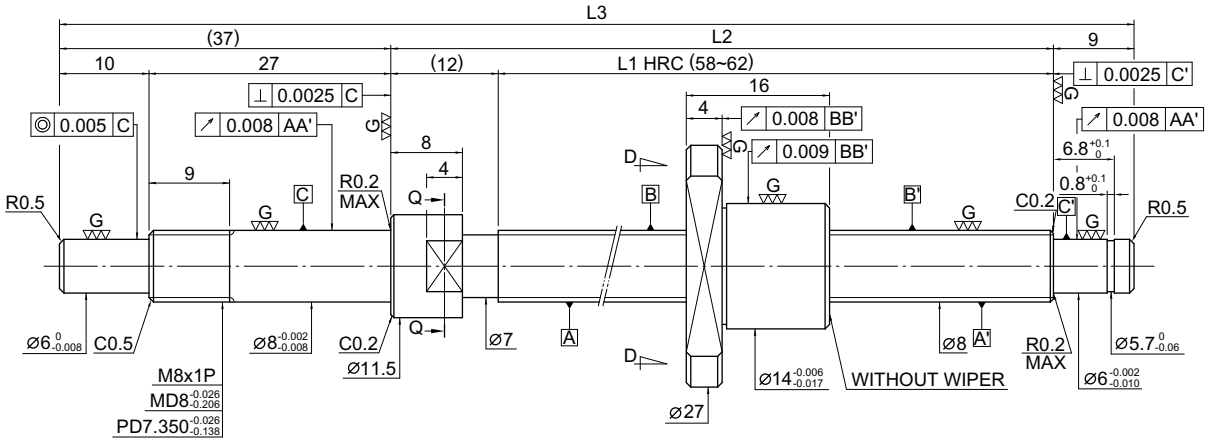
D-D VIEW

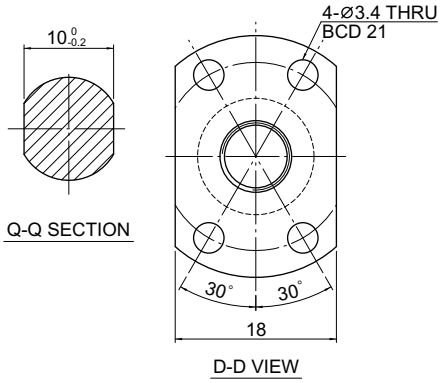
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	1.0	
Lead Angle	2.99°	
P.C.D. (mm)	6.1	
Steel Ball (mm)	ϕ 0.8	
Circuits	1x3	
Dynamic Load C (kgf)	66	
Static Load Co (kgf)	111	
Axial Play (mm)	0	0.005 MAX
Drag Torque (kgf-cm)	0.13 MAX	0.03 MAX
Spacer Ball	-	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
40	R6-1.0T3-FSI-65- 105-0.008	65	75	105	3
70	R6-1.0T3-FSI-95- 135-0.008	95	105	135	3
100	R6-1.0T3-FSI-125- 165-0.008	125	135	165	3

FSI TYPE（Shaft OD 8, Lead 1.0） Miniature



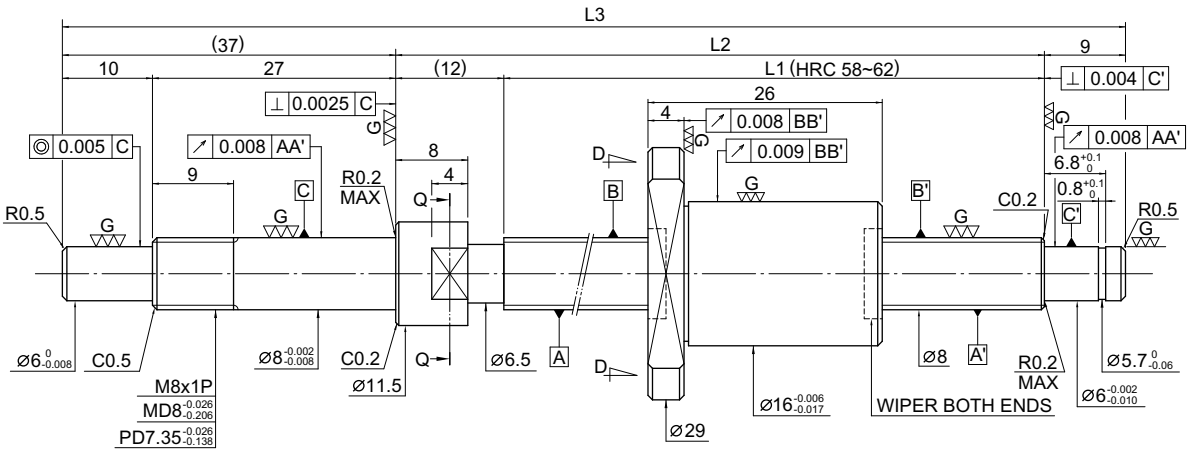


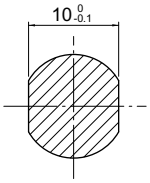
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	1.0	
Lead Angle	2.25°	
P.C.D. (mm)	8.1	
Steel Ball (mm)	ϕ 0.8	
Circuits	1x3	
Dynamic Load C (kgf)	79	
Static Load Co (kgf)	157	
Axial Play (mm)	0	0.005 MAX
Drag Torque (kgf-cm)	0.18 MAX	0.05 MAX
Spacer Ball	-	-

Unit : mm

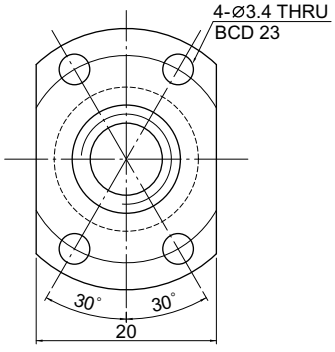
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
40	R8-1.0T3-FSI-80- 138-0.008	80	92	138	3
70	R8-1.0T3-FSI-110- 168-0.008	110	122	168	3
100	R8-1.0T3-FSI-140- 198-0.008	140	152	198	3
150	R8-1.0T3-FSI-190- 248-0.008	190	202	248	3

FSI TYPE (Shaft OD 8, Lead 2.0) Miniature





Q-Q SECTION



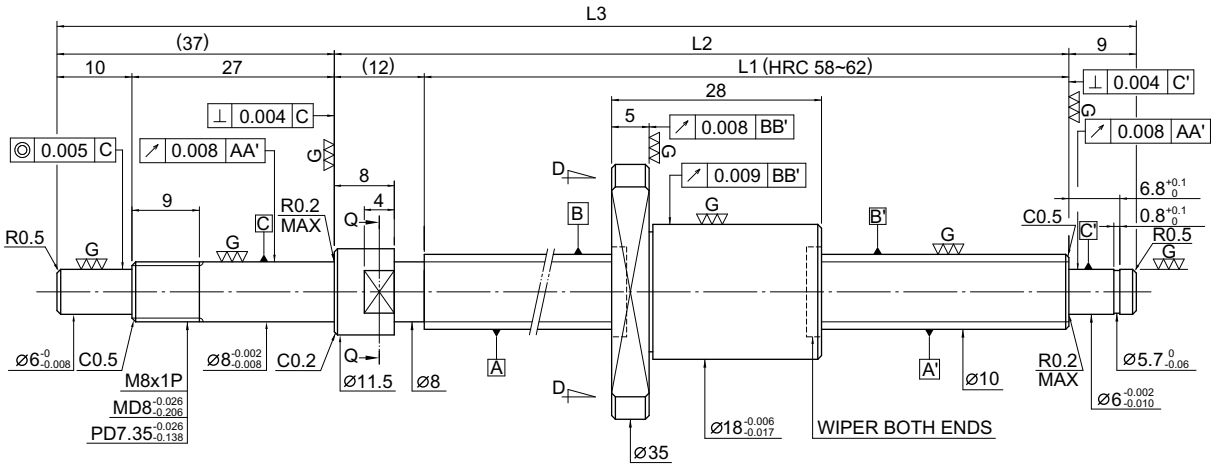
D-D VIEW

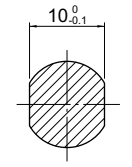
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	2	
Lead Angle	4.44°	
P.C.D. (mm)	8.2	
Steel Ball (mm)	ϕ 1.5	
Circuits	1x3	
Dynamic Load C (kgf)	170	
Static Load Co (kgf)	267	
Axial Play (mm)	0	0.005 MAX
Drag Torque (kgf-cm)	0.20 MAX	0.05 MAX
Spacer Ball	-	-

Unit : mm

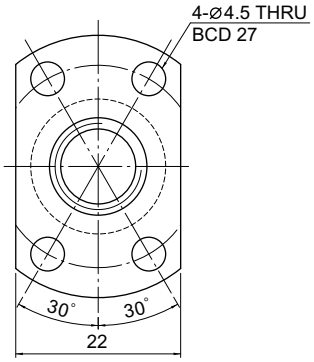
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
40	R8-2T3-FSI-80- 138-0.008	80	92	138	3
70	R8-2T3-FSI-110- 168-0.008	110	122	168	3
100	R8-2T3-FSI-140- 198-0.008	140	152	198	3
150	R8-2T3-FSI-190- 248-0.008	190	202	248	3

FSI TYPE (Shaft OD 10, Lead 2.0) Miniature





Q-Q SECTION



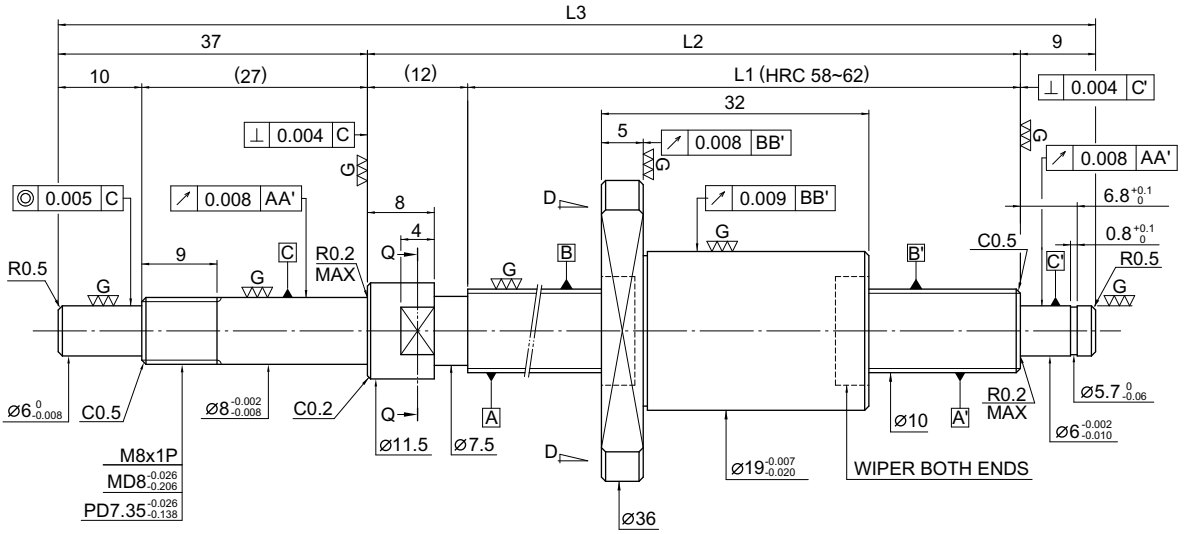
D-D VIEW

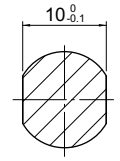
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	2	
Lead Angle	3.57°	
P.C.D. (mm)	10.2	
Steel Ball (mm)	ϕ 1.5	
Circuits	1x3	
Dynamic Load C (kgf)	196	
Static Load Co (kgf)	348	
Axial Play (mm)	0	0.005 MAX
Drag Torque (kgf-cm)	0.01~0.24	0.05 MAX
Spacer Ball	-	-

Unit : mm

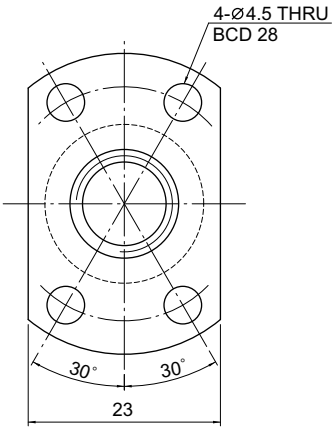
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
50	R10-2T3-FSI-100- 158-0.008	100	112	158	3
100	R10-2T3-FSI-150- 208-0.008	150	162	208	3
150	R10-2T3-FSI-200- 258-0.008	200	212	258	3
200	R10-2T3-FSI-250- 308-0.008	250	262	308	3

FSI TYPE（Shaft OD 10, Lead 2.5） Miniature





Q-Q SECTION



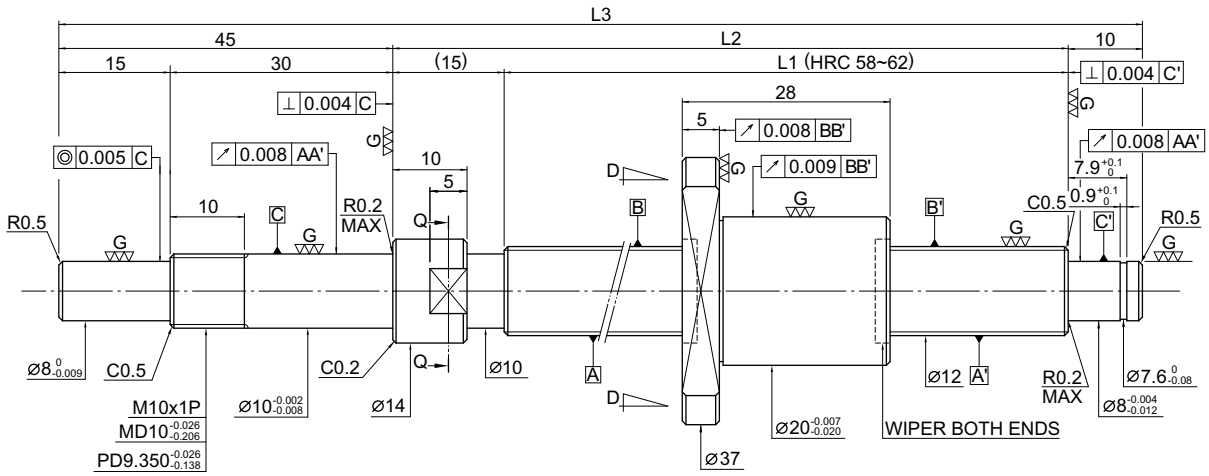
D-D VIEW

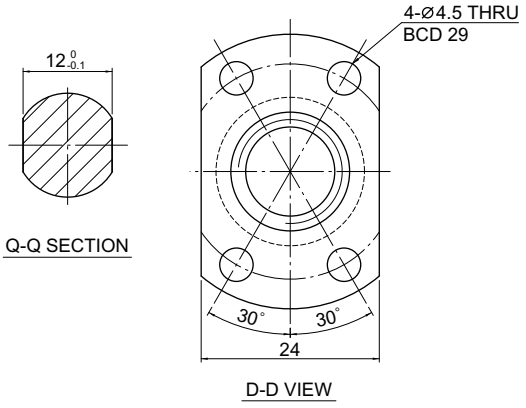
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	2.5	
Lead Angle	4.46°	
P.C.D. (mm)	10.2	
Steel Ball (mm)	ϕ 2	
Circuits	1x3	
Dynamic Load C (kgf)	274	
Static Load Co (kgf)	438	
Axial Play (mm)	0	0.005 MAX
Drag Torque (kgf-cm)	0.02~0.3	0.05 MAX
Spacer Ball	-	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
50	R10-2.5T3-FSI-100- 158-0.008	100	112	158	3
100	R10-2.5T3-FSI-150- 208-0.008	150	162	208	3
150	R10-2.5T3-FSI-200- 258-0.008	200	212	258	3
200	R10-2.5T3-FSI-250- 308-0.008	250	262	308	3

FSI TYPE (Shaft OD 12, Lead 2) Miniature



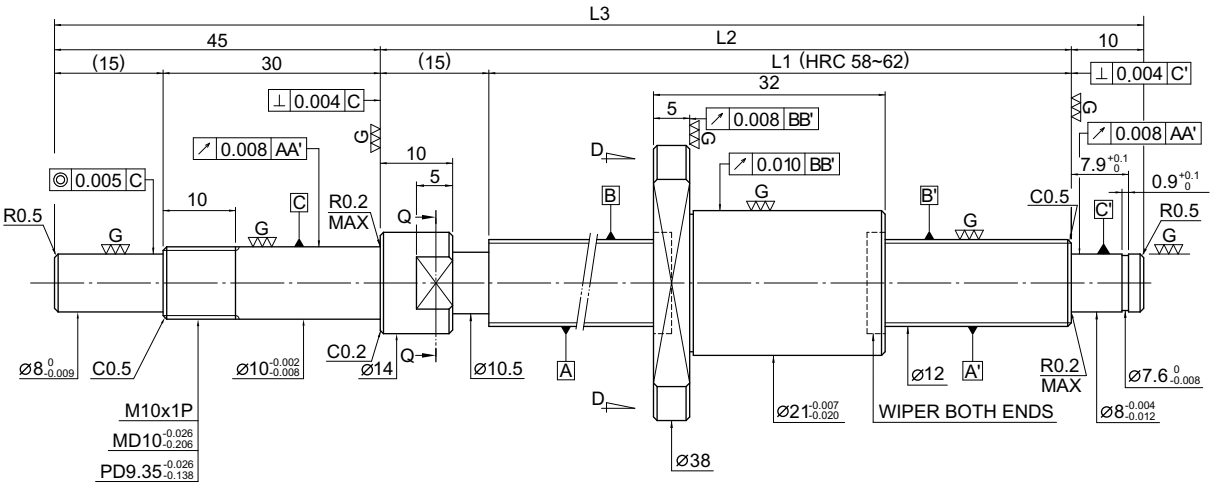


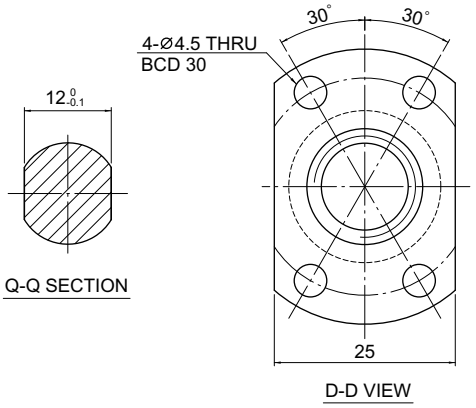
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	2	
Lead Angle	2.99°	
P.C.D. (mm)	12.2	
Steel Ball (mm)	ϕ 1.5	
Circuits	1x3	
Dynamic Load C (kgf)	217	
Static Load Co (kgf)	430	
Axial Play (mm)	0	0.005 MAX
Drag Torque (kgf-cm)	0.04~0.35	0.05 MAX
Spacer Ball	-	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
50	R12-2T3-FSI-110- 180-0.008	110	125	180	3
100	R12-2T3-FSI-160- 230-0.008	160	175	230	3
150	R12-2T3-FSI-210- 280-0.008	210	225	280	3
200	R12-2T3-FSI-260- 330-0.008	260	275	330	3
250	R12-2T3-FSI-310- 380-0.008	310	325	380	3

FSI TYPE (Shaft OD 12, Lead 2.5) Miniature



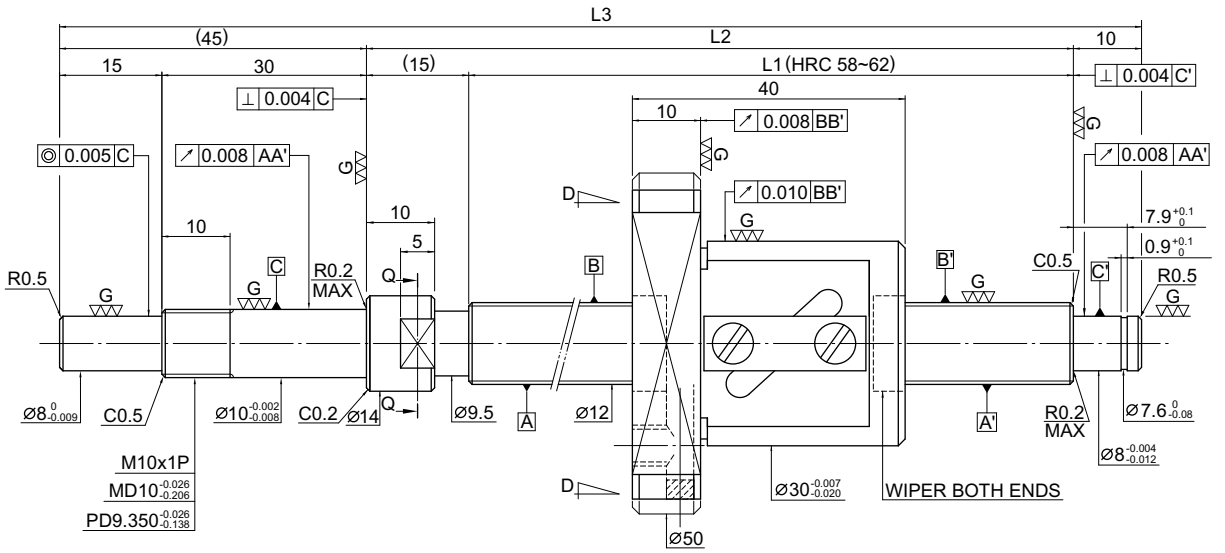


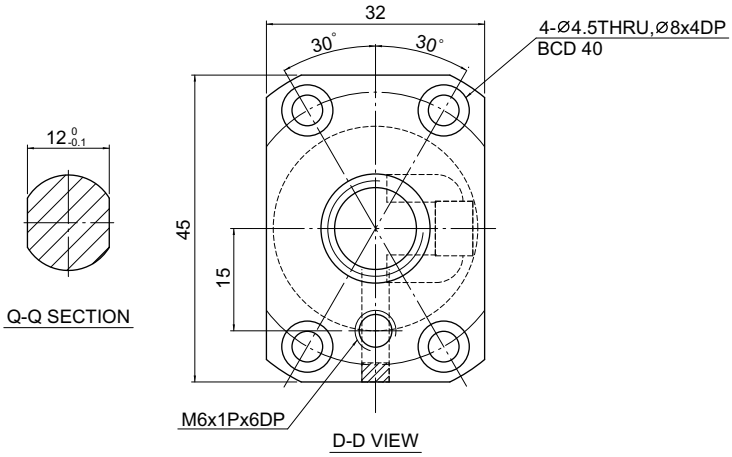
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	2.5	
Lead Angle	3.73°	
P.C.D. (mm)	12.2	
Steel Ball (mm)	ϕ 2	
Circuits	1x3	
Dynamic Load C (kgf)	309	
Static Load Co (kgf)	546	
Axial Play (mm)	0	0.005 MAX
Drag Torque (kgf-cm)	0.04~0.35	0.1 MAX
Spacer Ball	-	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
50	R12-2.5T3-FSI-110- 180-0.008	110	125	180	3
100	R12-2.5T3-FSI-160- 230-0.008	160	175	230	3
150	R12-2.5T3-FSI-210- 280-0.008	210	225	280	3
200	R12-2.5T3-FSI-260- 330-0.008	260	275	330	3
250	R12-2.5T3-FSI-310- 380-0.008	310	325	380	3

FSW TYPE (Shaft OD 12, Lead 5) Miniature



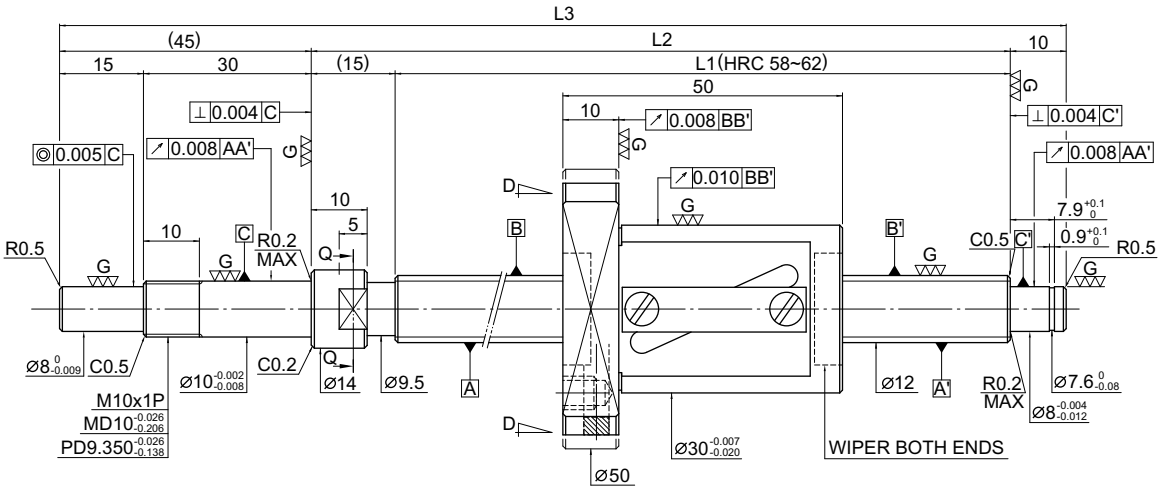


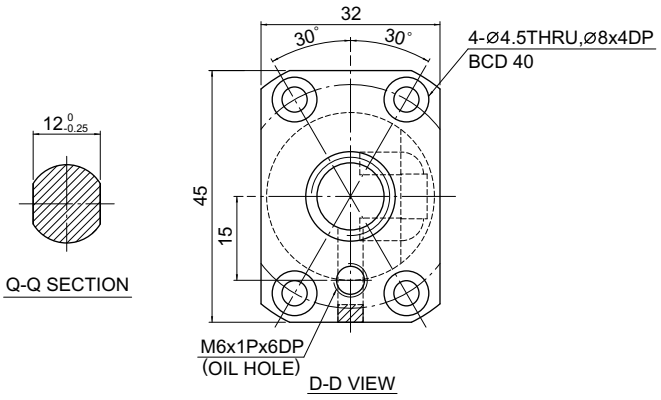
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	5	
Lead Angle	7.4°	
P.C.D. (mm)	12.25	
Steel Ball (mm)	ϕ 2.381	
Circuits	2.5x1	
Axial Play (mm)	0	0.005 or less
Dynamic Load C (kgf)	241	382
Static Load Co (kgf)	319	637
Drag Torque (kgf-cm)	0.1~0.45	0.1 MAX
Spacer Ball	1 : 1	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
50	R12-5B1-FSW-110- 180-0.008	110	125	180	3
100	R12-5B1-FSW -160- 230-0.008	160	175	230	3
150	R12-5B1-FSW -210- 280-0.008	210	225	280	3
200	R12-5B1-FSW -260- 330-0.008	260	275	330	3
250	R12-5B1-FSW -310- 380-0.008	310	325	380	3
350	R12-5B1-FSW -410- 480-0.008	410	425	480	3
450	R12-5B1-FSW -510- 580-0.008	510	525	580	3

FSW TYPE (Shaft OD 12, Lead 10) Miniature



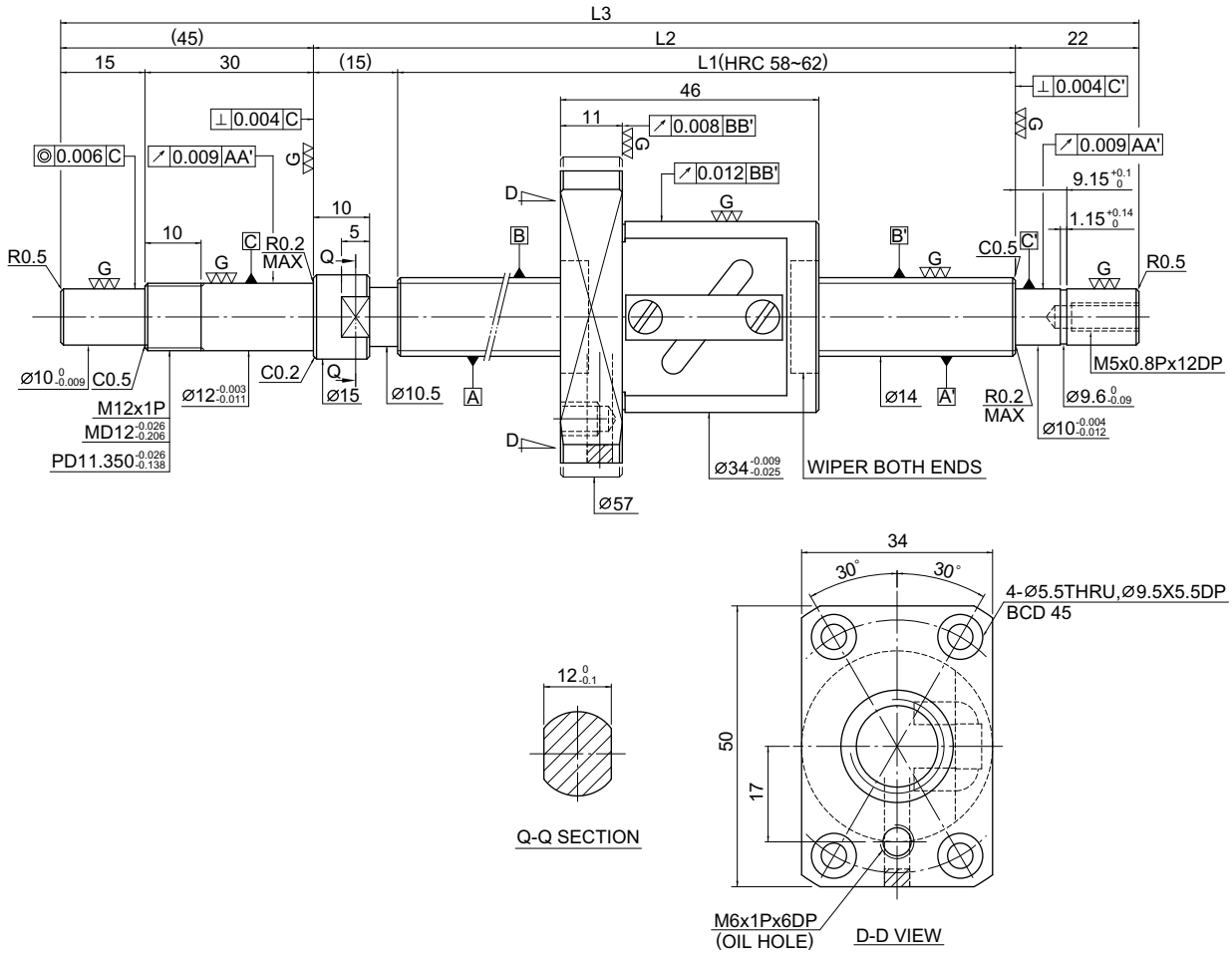


Ballscrew Data		
Direction	Right Hand	
Lead (mm)	10	
Lead Angle	14.57°	
P.C.D. (mm)	12.25	
Steel Ball (mm)	ϕ 2.381	
Circuits	2.5x1	
Axial Play (mm)	0	0.005 or less
Dynamic Load C (kgf)	241	382
Static Load Co (kgf)	319	637
Drag Torque (kgf-cm)	0.1~0.5	0.15 MAX
Spacer Ball	1 : 1	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
100	R12-10B1-FSW -160- 230-0.008	160	175	230	3
150	R12-10B1-FSW -210- 280-0.008	210	225	280	3
250	R12-10B1-FSW -310- 380-0.008	310	325	380	3
350	R12-10B1-FSW -410- 480-0.008	410	425	480	3
450	R12-10B1-FSW -510- 580-0.008	510	525	580	3

FSW TYPE (Shaft OD 14, Lead 8) Miniature



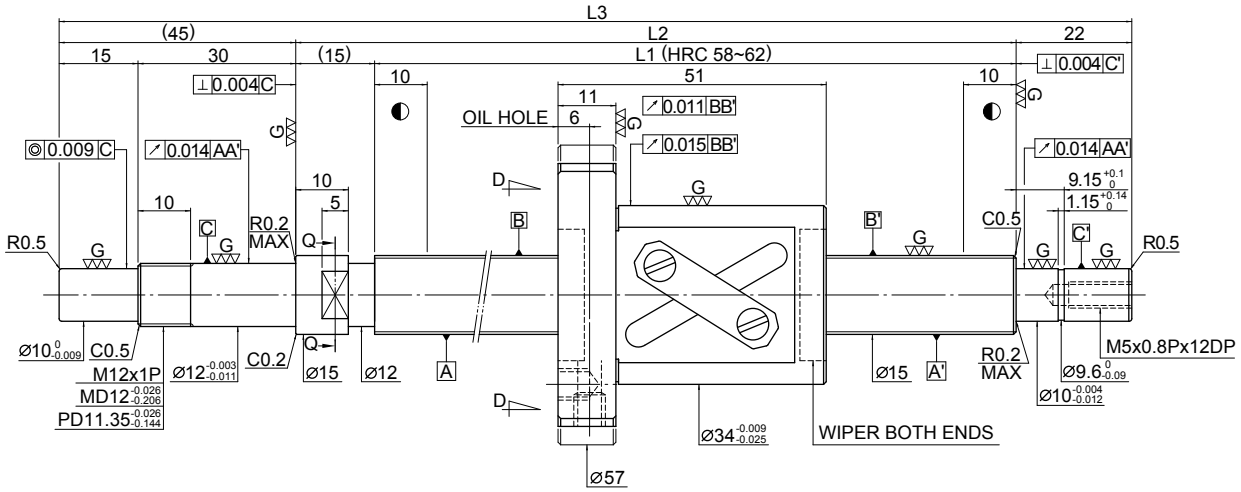
Unit : mm

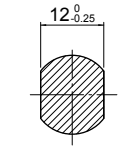
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
100	R14-8B1-FSW-189- 271-0.008	189	204	271	3
150	R14-8B1-FSW-239- 321-0.008	239	254	321	3
200	R14-8B1-FSW-289- 371-0.008	289	304	371	3
250	R14-8B1-FSW-339- 421-0.008	339	354	421	3
300	R14-8B1-FSW-389- 471-0.008	389	404	471	3
350	R14-8B1-FSW-439- 521-0.008	439	454	521	3
400	R14-8B1-FSW-489- 571-0.008	489	504	571	3
450	R14-8B1-FSW-539-621-0.008	539	554	621	3
500	R14-8B1-FSW-589- 671-0.008	589	604	671	3
550	R14-8B1-FSW-639- 721-0.008	639	654	721	3
600	R14-8B1-FSW-689- 771-0.008	689	704	771	3
700	R14-8B1-FSW-789- 871-0.008	789	804	871	3
600	R14-5B1-FSW-689- 771-0.008	689	704	771	3

Ballscrew Data		
Direction	Right Hand	
Lead (mm)	8	
Lead Angle	9.89°	
P.C.D. (mm)	14.6	
Steel Ball (mm)	ϕ 3.175	
Circuits	2.5x1	
Axial Play (mm)	0	0.005 or less
Dynamic Load C (kgf)	448	710
Static Load Co (kgf)	608	1215
Drag Torque (kgf-cm)	0.15~0.79	0.24 MAX
Spacer Ball	1 : 1	-

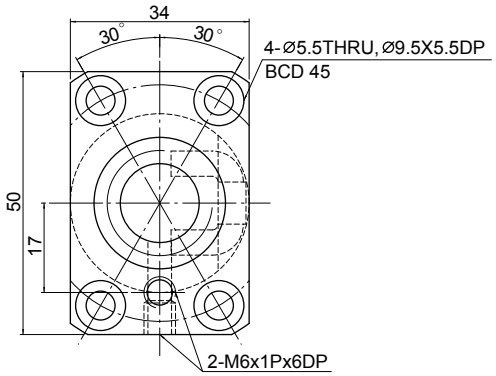
3.4 Dimensions for *HIWIN* End Machining Ground Ballscrew Series

FSW TYPE（Shaft OD 15, Lead 10） Standard





Q-Q SECTION



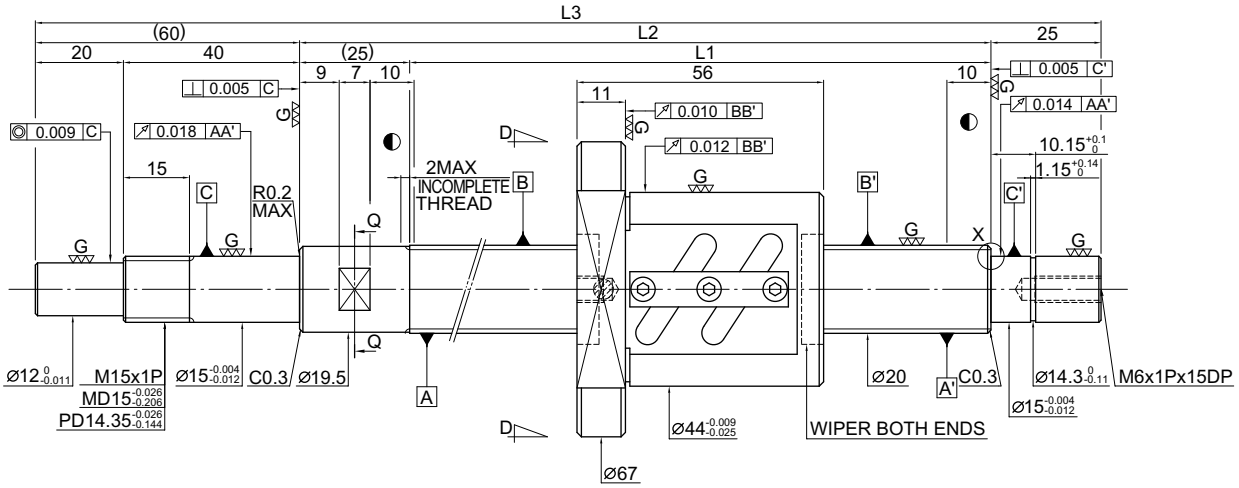
D-D VIEW

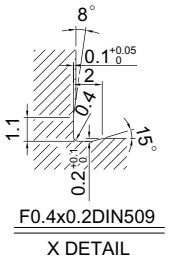
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	10	
Lead Angle	11.53°	
P.C.D. (mm)	15.6	
Steel Ball (mm)	ϕ 3.175	
Circuits	2.5x1	
Axial Play (mm)	0	0.005 or less
Dynamic Load C (kgf)	460	729
Static Load Co (kgf)	645	1290
Drag Torque (kgf-cm)	0.15~0.79	0.24 MAX
Spacer Ball	1 : 1	-

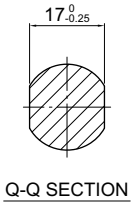
Unit : mm

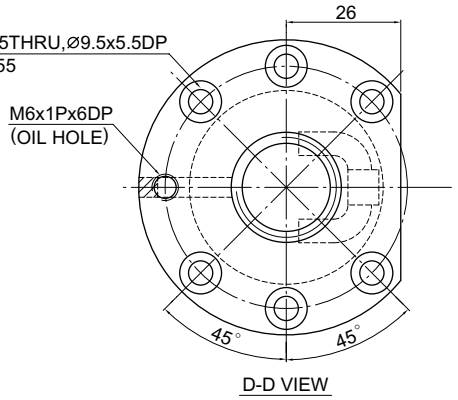
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
100	R15-10B1-FSW- 189 - 271-0.018	189	204	271	5
150	R15-10B1-FSW- 239 - 321-0.018	239	254	321	5
200	R15-10B1-FSW- 289 - 371-0.018	289	304	371	5
250	R15-10B1-FSW- 339 - 421-0.018	339	354	421	5
300	R15-10B1-FSW- 389 - 471-0.018	389	404	471	5
350	R15-10B1-FSW- 439 - 521-0.018	439	454	521	5
400	R15-10B1-FSW- 489 - 571-0.018	489	504	571	5
450	R15-10B1-FSW- 539 - 621-0.018	539	554	621	5
500	R15-10B1-FSW- 589 - 671-0.018	589	604	671	5
550	R15-10B1-FSW- 639 - 721-0.018	639	654	721	5
600	R15-10B1-FSW- 689 - 771-0.018	689	704	771	5
700	R15-10B1-FSW- 789 - 871-0.018	789	804	871	5
800	R15-10B1-FSW- 889 - 971-0.018	889	904	971	5
1000	R15-10B1-FSW- 1089 - 1171-0.018	1089	1104	1171	5

FSW TYPE (Shaft OD 20, Lead 5) Standard







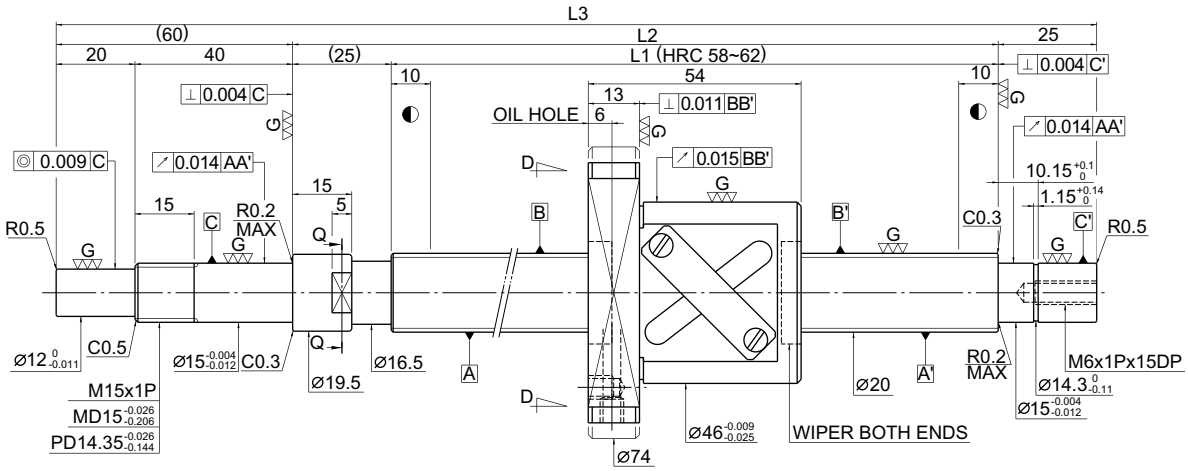


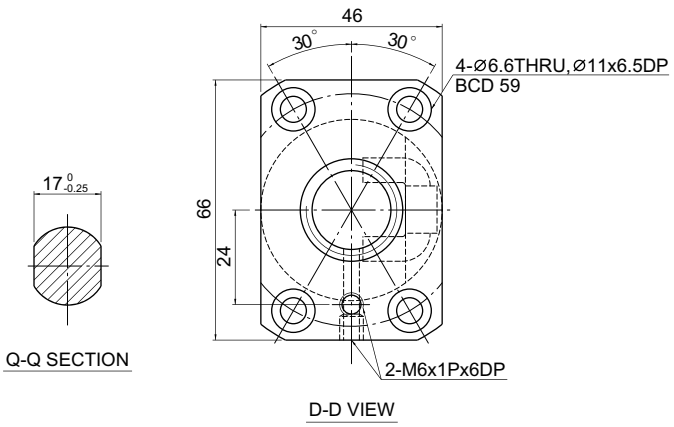
Ballscrew Data	
Direction	Right Hand
Lead (mm)	5
Lead Angle	4.42°
P.C.D. (mm)	20.6
Steel Ball (mm)	ϕ 3.175
Circuits	2.5x2
Axial Play (mm)	0
Dynamic Load C (kgf)	952
Static Load Co (kgf)	1732
Drag Torque (kgf-cm)	0.28~1.32
Spacer Ball	1 : 1

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	R20-5B2-FSW-225-335-0.018	225	250	335	5
200	R20-5B2-FSW-275-385-0.018	275	300	385	5
300	R20-5B2-FSW-375-485-0.018	375	400	485	5
400	R20-5B2-FSW-475-585-0.018	475	500	585	5
500	R20-5B2-FSW-575-685-0.018	575	600	685	5
700	R20-5B2-FSW-775-885-0.018	775	800	885	5

FSW TYPE（Shaft OD 20, Lead 10） Standard



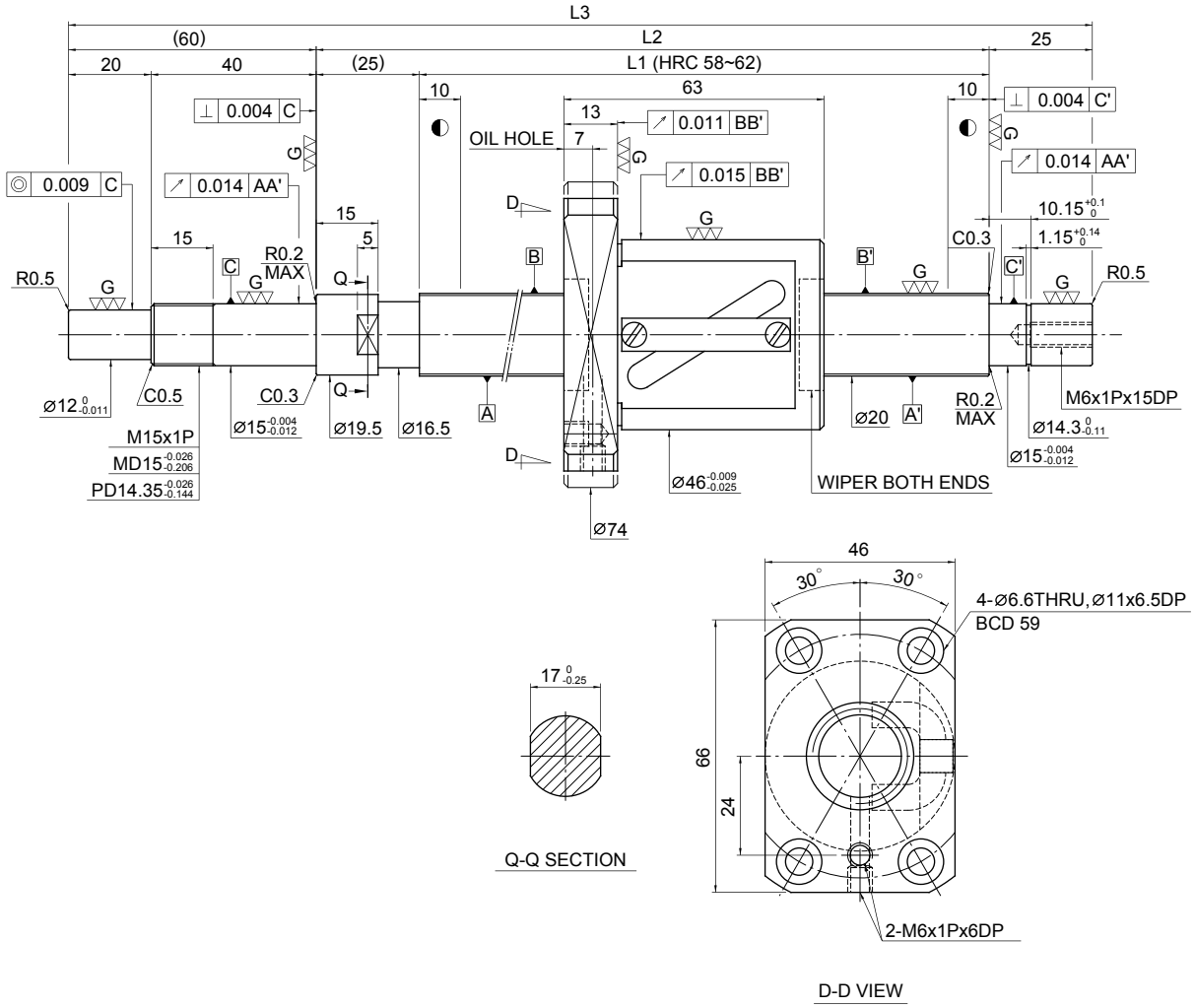


Unit : mm

Ballscrew Data		
Direction	Right Hand	
Lead (mm)	10	
Lead Angle	8.7°	
P.C.D. (mm)	20.8	
Steel Ball (mm)	ϕ 3.969	
Circuits	2.5x1	
Axial Play (mm)	0	0.005 MAX
Dynamic Load C (kgf)	718	1139
Static Load Co (kgf)	1094	2187
Drag Torque (kgf-cm)	0.2~1.2	0.3 MAX
Spacer Ball	1 : 1	-

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
200	R20-10B1-FSW- 289 - 399-0.018	289	314	399	5
300	R20-10B1-FSW- 389 - 499-0.018	389	414	499	5
400	R20-10B1-FSW- 489 - 599-0.018	489	514	599	5
500	R20-10B1-FSW- 589 - 699-0.018	589	614	699	5
600	R20-10B1-FSW- 689 - 799-0.018	689	714	799	5
700	R20-10B1-FSW- 789 - 899-0.018	789	814	899	5
800	R20-10B1-FSW- 889 - 999-0.018	889	914	999	5
900	R20-10B1-FSW- 989 -1099-0.018	989	1014	1099	5
1000	R20-10B1-FSW- 1089 -1199-0.018	1089	1114	1199	5
1100	R20-10B1-FSW- 1189 -1299-0.018	1189	1214	1299	5
1400	R20-10B1-FSW- 1289 -1399-0.018	1289	1314	1399	5

FSW TYPE（Shaft OD 20, Lead 20） Standard

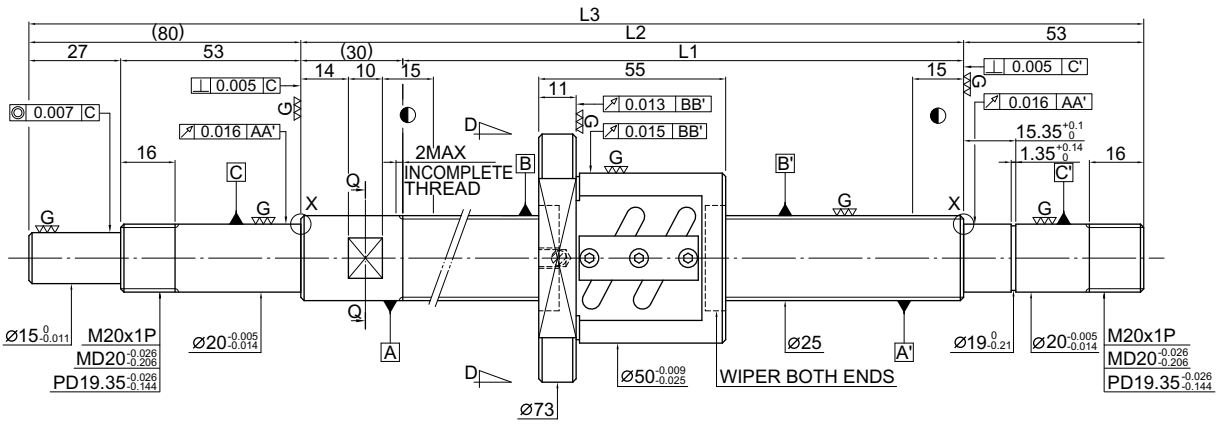


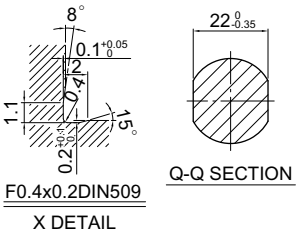
Unit : mm

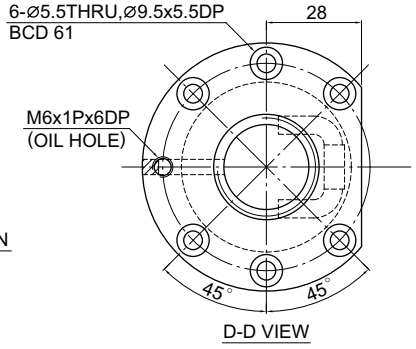
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	20	
Lead Angle	17.01°	
P.C.D. (mm)	20.8	
Steel Ball (mm)	ϕ 3.969	
Circuits	1.5x1	
Axial Play (mm)	0	0.005 MAX
Dynamic Load C (kgf)	453	719
Static Load Co (kgf)	641	1280
Drag Torque (kgf-cm)	0.2~1.2	0.3 MAX
Spacer Ball	1 : 1	-

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
200	R20-20A1-FSW- 310 - 420-0.018	310	335	420	5
300	R20-20A1-FSW- 410 - 520-0.018	410	435	520	5
400	R20-20A1-FSW- 510 - 620-0.018	510	535	620	5
500	R20-20A1-FSW- 610 - 720-0.018	610	635	720	5
600	R20-20A1-FSW- 710 - 820-0.018	710	735	820	5
700	R20-20A1-FSW- 810 - 920-0.018	810	835	920	5
800	R20-20A1-FSW- 910 - 1020-0.018	910	935	1020	5
900	R20-20A1-FSW- 1010 - 1120-0.018	1010	1035	1120	5
1000	R20-20A1-FSW- 1110 - 1220-0.018	1110	1135	1220	5
1100	R20-20A1-FSW- 1210 - 1320-0.018	1210	1235	1320	5
1400	R20-20A1-FSW- 1510 - 1620-0.018	1510	1535	1620	5

FSW TYPE (Shaft OD 25, Lead 5) Standard





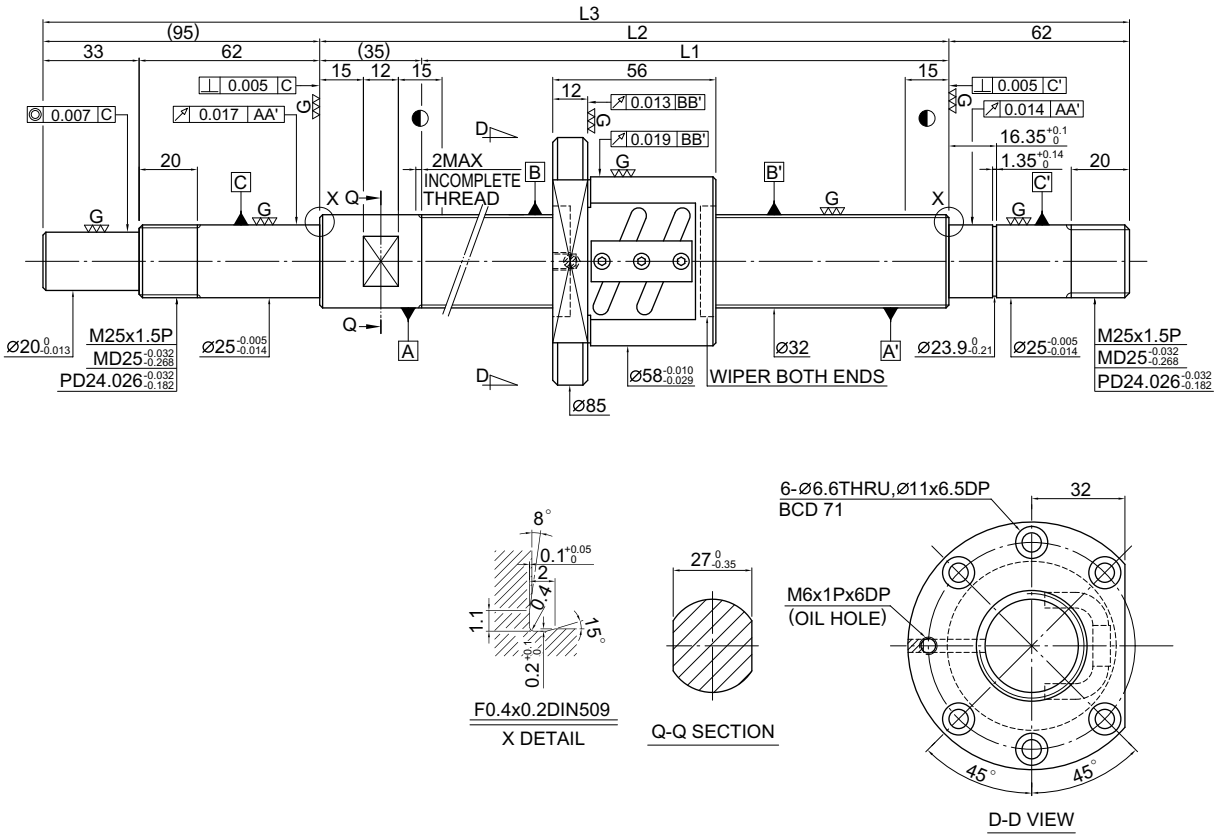


Ballscrew Data	
Direction	Right Hand
Lead (mm)	5
Lead Angle	3.56°
P.C.D. (mm)	25.6
Steel Ball (mm)	ϕ 3.175
Circuits	1.5x2
Axial Play (mm)	0
Dynamic Load C (kgf)	1073
Static Load Co (kgf)	2209
Drag Torque (kgf-cm)	0.36~1.44
Spacer Ball	1 : 1

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	R25-5B2-FSW-220-349-0.018	220	250	349	5
200	R25-5B2-FSW-270-399-0.018	270	300	399	5
300	R25-5B2-FSW-370-499-0.018	370	400	499	5
400	R25-5B2-FSW-470-599-0.018	470	500	599	5
500	R25-5B2-FSW-570-733-0.018	570	600	733	5
600	R25-5B2-FSW-670-833-0.018	670	700	833	5
700	R25-5B2-FSW-770-933-0.018	770	800	933	5
900	R25-5B2-FSW-970-1133-0.018	970	1000	1133	5
1000	R25-5B2-FSW-1170-1333-0.018	1170	1200	1333	5

FSW TYPE（Shaft OD 32, Lead 5） Standard

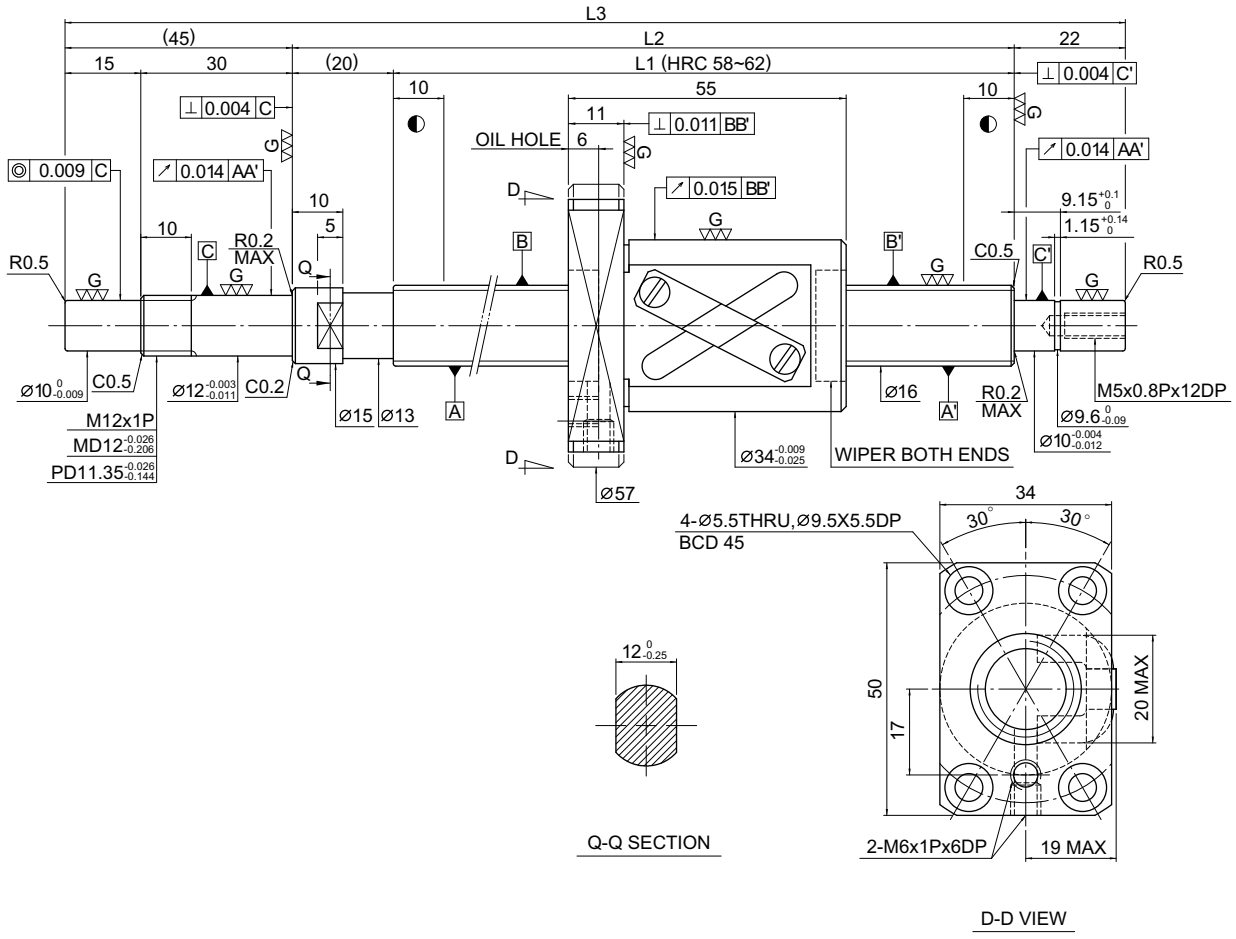


Ballscrew Data	
Direction	Right Hand
Lead (mm)	5
Lead Angle	2.79°
P.C.D. (mm)	32.6
Steel Ball (mm)	ϕ 3.175
Circuits	2.5x2
Axial Play (mm)	0
Dynamic Load C (kgf)	1188
Static Load Co (kgf)	2833
Drag Torque (kgf-cm)	0.48~1.92
Spacer Ball	1 : 1

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	R32-5B2-FSW-265-415-0.018	265	300	415	5
250	R32-5B2-FSW-365-515-0.018	365	400	515	5
350	R32-5B2-FSW-465-615-0.018	465	500	615	5
450	R32-5B2-FSW-565-715-0.018	565	600	715	5
550	R32-5B2-FSW-665-857-0.018	665	700	857	5
650	R32-5B2-FSW-765-957-0.018	765	800	957	5
850	R32-5B2-FSW-965-1157-0.018	965	1000	1157	5
1050	R32-5B2-FSW-1165-1357-0.018	1165	1200	1357	5
1350	R32-5B2-FSW-1465-1657-0.018	1465	1500	1657	5

FSV TYPE（Shaft OD 16, Lead 16） Standard

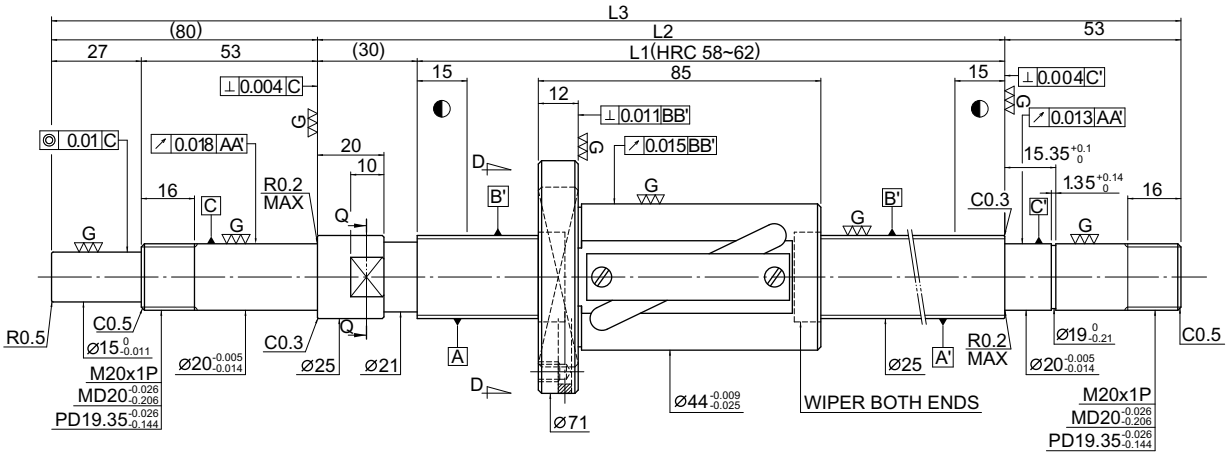


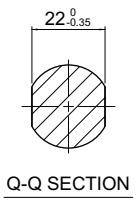
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
100	R16-16A1-FSV-184- 271-0.018	184	204	271	5
150	R16-16A1-FSV-234- 321-0.018	234	254	321	5
200	R16-16A1-FSV-284- 371-0.018	284	304	371	5
250	R16-16A1-FSV-334- 421-0.018	334	354	421	5
300	R16-16A1-FSV-384- 471-0.018	384	404	471	5
350	R16-16A1-FSV-434- 521-0.018	434	454	521	5
400	R16-16A1-FSV-484- 571-0.018	484	504	571	5
450	R16-16A1-FSV-534- 621-0.018	534	554	621	5
500	R16-16A1-FSV-584- 671-0.018	584	604	671	5
550	R16-16A1-FSV-634- 721-0.018	634	654	721	5
600	R16-16A1-FSV- 684-771-0.018	684	704	771	5
700	R16-16A1-FSV- 784-871-0.018	784	804	871	5
800	R16-16A1-FSV- 884-971-0.018	884	904	971	5
1000	R16-16A1-FSV- 1084-1171-0.018	1084	1104	1171	5

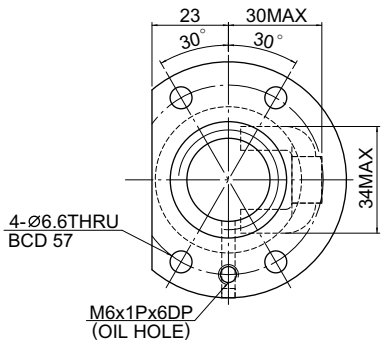
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	16	
Lead Angle	17.05°	
P.C.D. (mm)	16.6	
Steel Ball (mm)	ϕ 3.175	
Circuits	1.5x2	
Axial Play (mm)	0	0.005 MAX
Dynamic Load C (kgf)	304	481
Static Load Co (kgf)	410	819
Drag Torque (kgf-cm)	0.15~0.79	0.24 MAX
Spacer Ball	1 : 1	-

FSV TYPE (Shaft OD 25, Lead 20) Standard





Q-Q SECTION



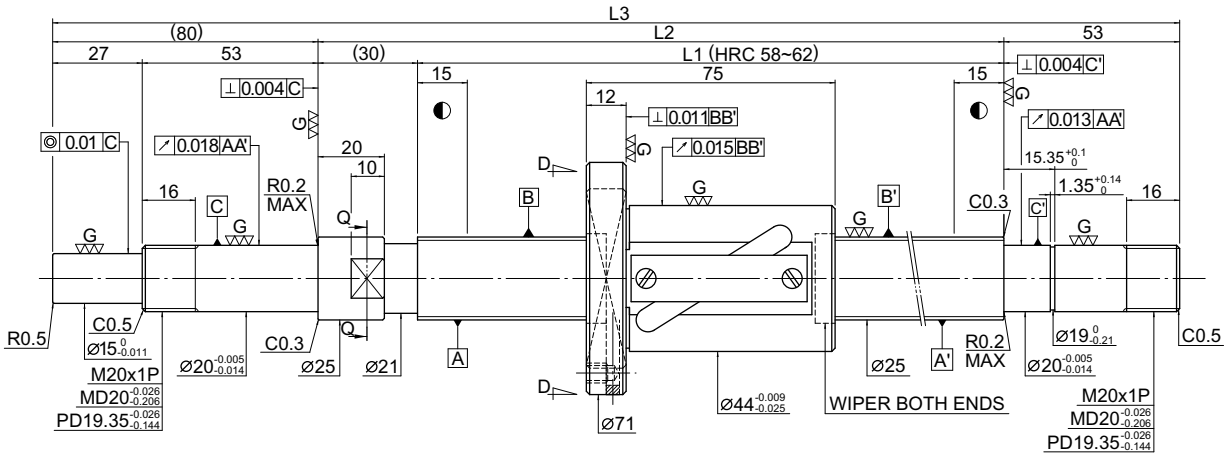
D-D VIEW

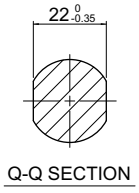
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	20	
Lead Angle	13.75°	
P.C.D. (mm)	26	
Steel Ball (mm)	ϕ 4.763	
Circuits	2.5x2	
Axial Play (mm)	0	0.005 MAX
Dynamic Load C (kgf)	1003	1591
Static Load Co (kgf)	1619	3236
Drag Torque (kgf-cm)	0.4~2.5	0.25 MAX
Spacer Ball	1 : 1	-

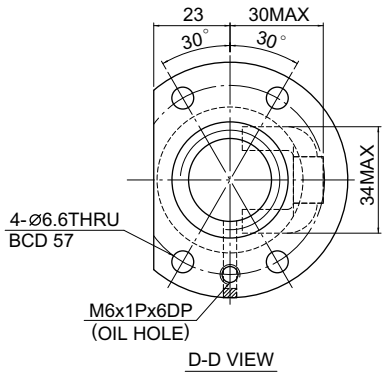
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
600	R25-20B1-FSV- 750- 913-0.018	750	780	913	5
800	R25-20B1-FSV- 950- 1113-0.018	950	980	1113	5
1000	R25-20B1-FSV- 1150- 1313-0.018	1150	1180	1313	5
1200	R25-20B1-FSV- 1350- 1513-0.018	1350	1380	1513	5
1400	R25-20B1-FSV- 1550- 1713-0.018	1550	1580	1713	5
1600	R25-20B1-FSV- 1750- 1913-0.018	1750	1780	1913	5
2000	R25-20B1-FSV- 2150- 2313-0.018	2150	2180	2313	5

FSV TYPE (Shaft OD 25, Lead 25) Standard





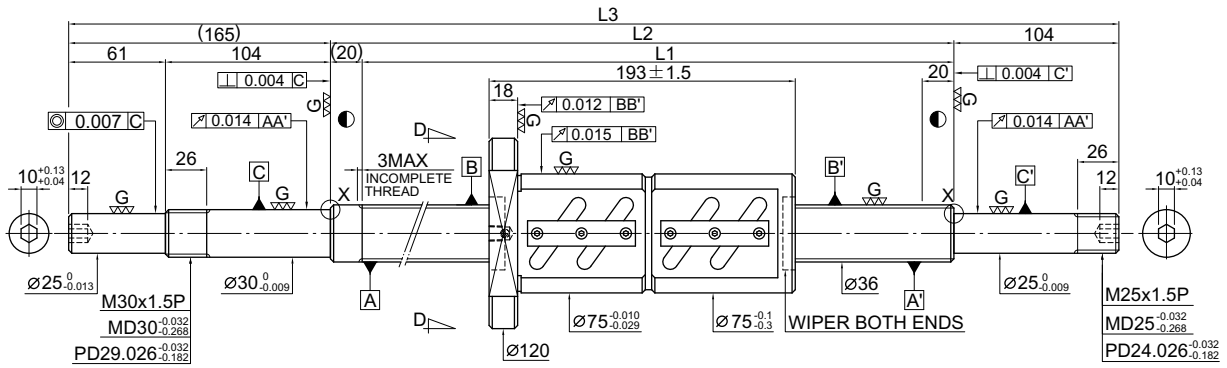


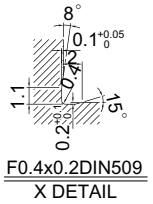
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	25	
Lead Angle	17.01°	
P.C.D. (mm)	26	
Steel Ball (mm)	ϕ 4.763	
Circuits	1.5x2	
Axial Play (mm)	0	0.005 MAX
Dynamic Load C (kgf)	642	1018
Static Load Co (kgf)	964	1926
Drag Torque (kgf-cm)	0.4~2.5	0.24 MAX
Spacer Ball	1 : 1	-

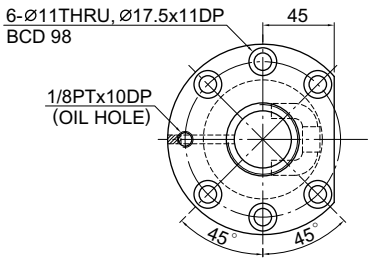
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
600	R25-25A1-FSV- 750- 913-0.018	750	780	913	5
800	R25-25A1-FSV- 950-1113-0.018	950	980	1113	5
1000	R25-25A1-FSV-1150-1313-0.018	1150	1180	1313	5
1200	R25-25A1-FSV-1350-1513-0.018	1350	1380	1513	5
1400	R25-25A1-FSV-1550-1713-0.018	1550	1580	1713	5
1600	R25-25A1-FSV-1750-1913-0.018	1750	1780	1913	5
2000	R25-25A1-FSV-2150-2313-0.018	2150	2180	2313	5

FDW TYPE（Shaft OD 36, Lead 10） Standard





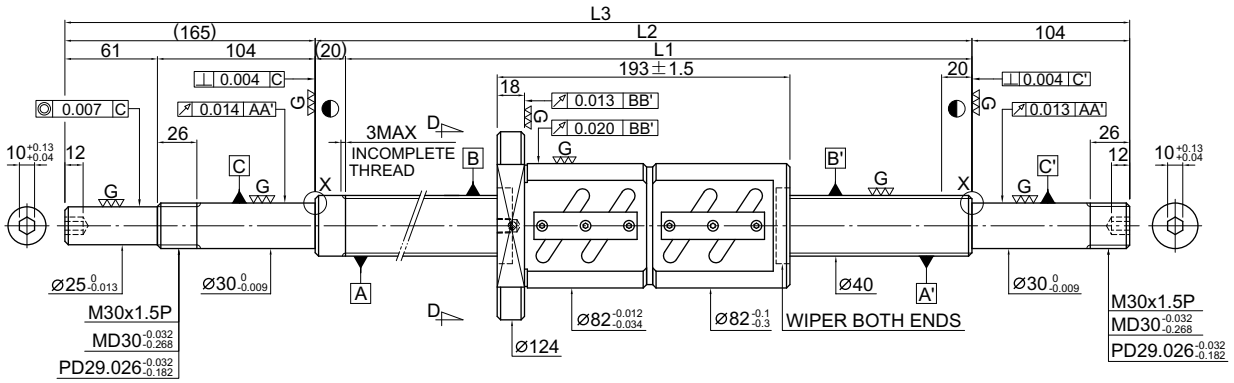


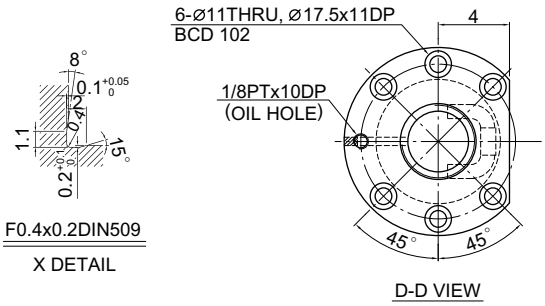
Ballscrew Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	4.86°
P.C.D. (mm)	37.4
Steel Ball (mm)	ϕ 6.35
Circuits	2.5x2
Axial Play (mm)	0
Dynamic Load C (kgf)	5105
Static Load Co (kgf)	12668
Drag Torque (kgf-cm)	6.64~12.34
Spacer Ball	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R36-10B2-FDW-480-685-0.018	480	500	685	5
450	R36-10B2-FDW-680-885-0.018	680	700	885	5
750	R36-10B2-FDW-980-1269-0.018	980	1000	1269	5
1150	R36-10B2-FDW-1380-1669-0.018	1380	1400	1669	5
1550	R36-10B2-FDW-1780-2069-0.018	1780	1800	2069	5

FDW TYPE（Shaft OD 40, Lead 10） Standard



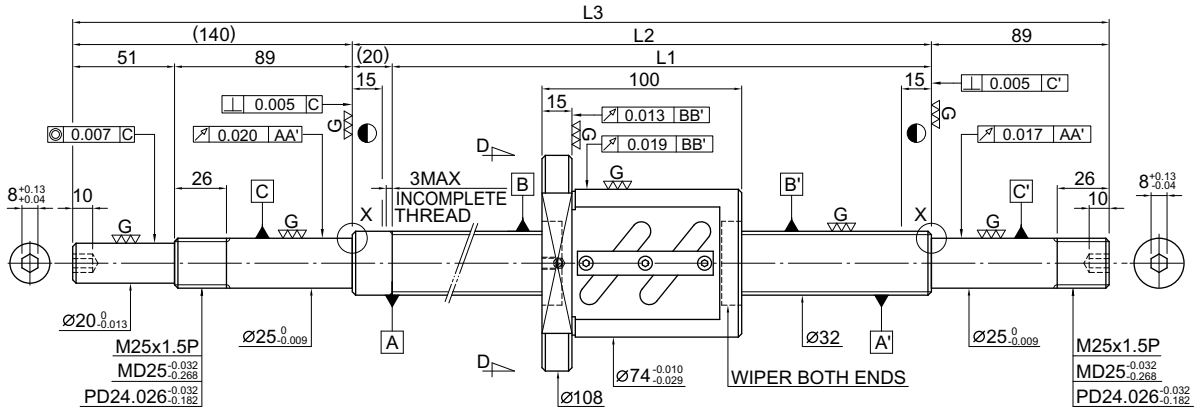


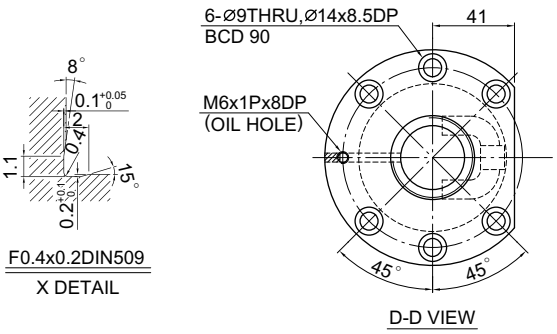
Unit : mm

Ballscrew Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	4.4°
P.C.D. (mm)	41.4
Steel Ball (mm)	ϕ 6.35
Circuits	2.5x2
Axial Play (mm)	0
Dynamic Load C (kgf)	5369
Static Load Co (kgf)	14138
Drag Torque (kgf-cm)	8.26~13.78
Spacer Ball	-

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R40-10B2-FDW-480-687-0.018	480	500	687	5
350	R40-10B2-FDW-580-787-0.018	580	600	787	5
450	R40-10B2-FDW-680-887-0.018	680	700	887	5
550	R40-10B2-FDW-780-1069-0.018	780	800	1069	5
750	R40-10B2-FDW-980-1269-0.018	980	1000	1269	5
950	R40-10B2-FDW-1180-1469-0.018	1180	1200	1469	5
1150	R40-10B2-FDW-1380-1669-0.018	1380	1400	1669	5
1350	R40-10B2-FDW-1580-1869-0.018	1580	1600	1869	5
1550	R40-10B2-FDW-1780-2069-0.018	1780	1800	2069	5
2150	R40-10B2-FDW-2380-2669-0.018	2380	2400	2669	5

OFSW TYPE （Shaft OD 32, Lead 10） Standard





F0.4x0.2DIN509
X DETAIL

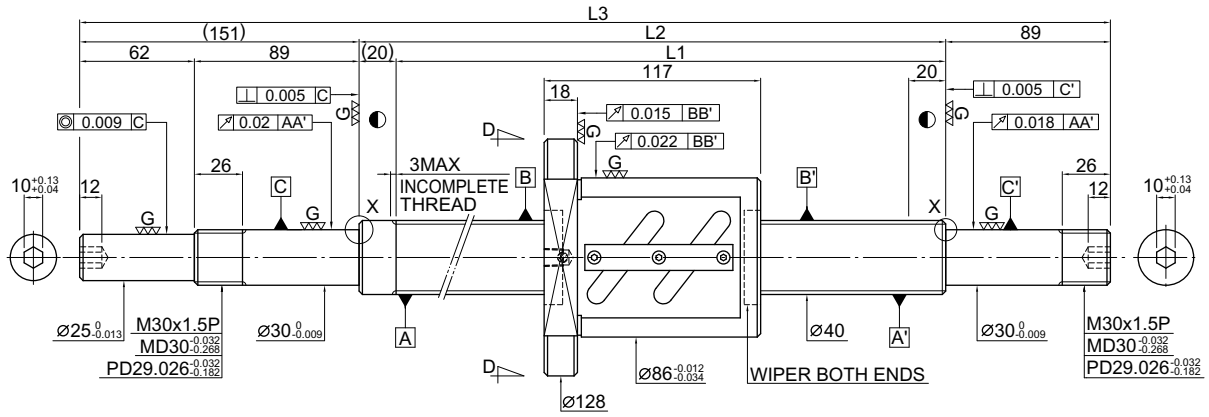
D-D VIEW

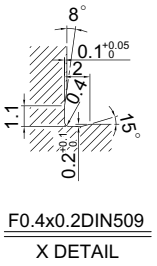
Ballscrew Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	5.44°
P.C.D. (mm)	33.4
Steel Ball (mm)	ϕ 6.35
Circuits	2.5x1
Axial Play (mm)	0
Dynamic Load C (kgf)	2650
Static Load Co (kgf)	5599
Drag Torque (kgf-cm)	3.58~7.44
Spacer Ball	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R32-10B1-OFSW-380-560-0.018	380	400	560	5
350	R32-10B1-OFSW-480-660-0.018	480	500	660	5
450	R32-10B1-OFSW-580-760-0.018	580	600	760	5
550	R32-10B1-OFSW-680-929-0.018	680	700	929	5
650	R32-10B1-OFSW-780-1029-0.018	780	800	1029	5
850	R32-10B1-OFSW-980-1229-0.018	980	1000	1229	5
1050	R32-10B1-OFSW-1180-1429-0.018	1180	1200	1429	5
1350	R32-10B1-OFSW-1480-1729-0.018	1480	1500	1729	5
1650	R32-10B1-OFSW-1780-2029-0.018	1780	1800	2029	5

OFSW TYPE (Shaft OD 40, Lead 12) Standard





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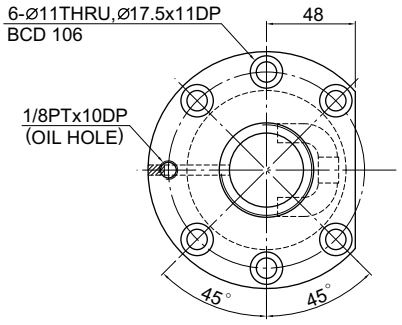
X DETAIL



D-D VIEW

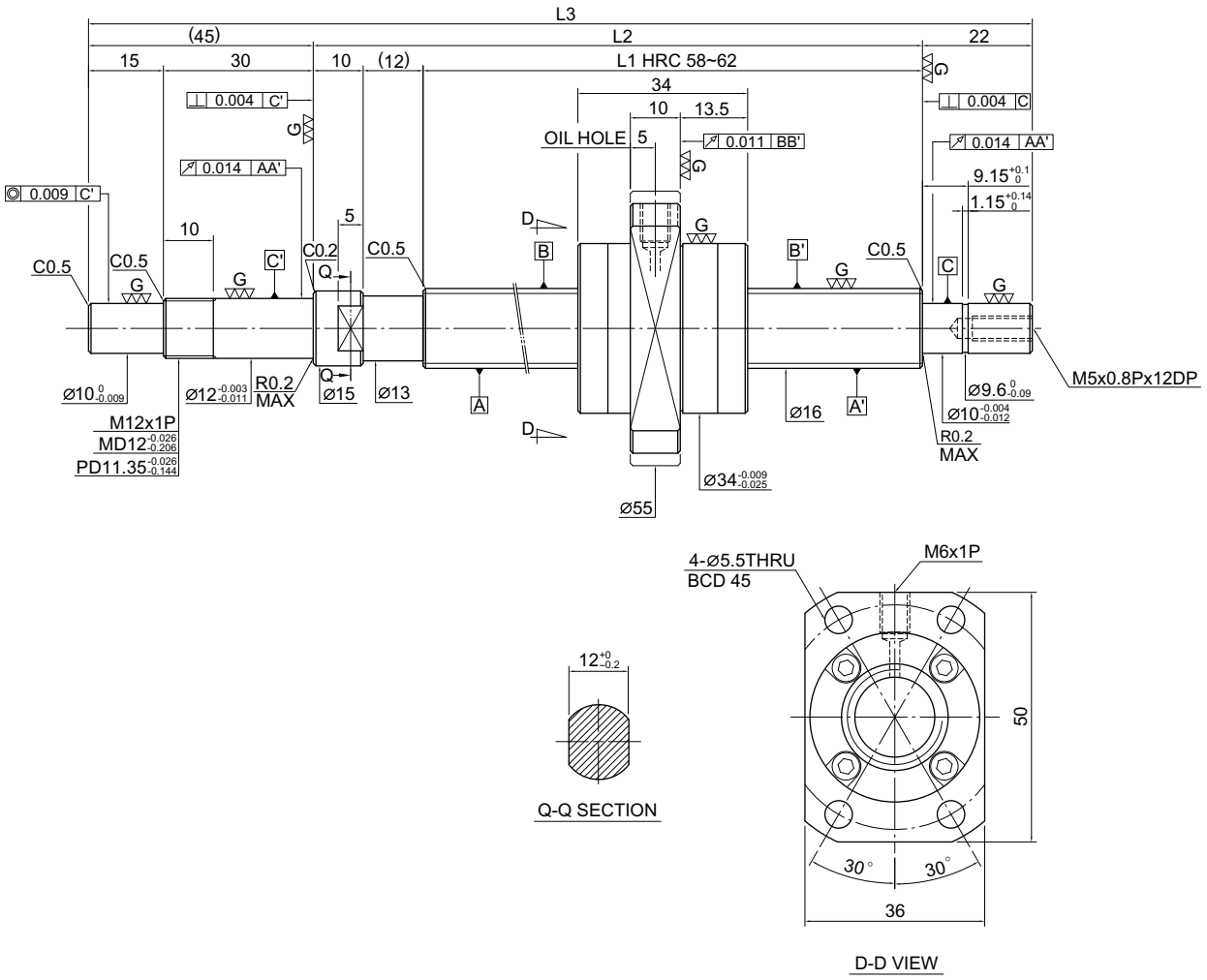
Ballscrew Data	
Direction	Right Hand
Lead (mm)	12
Lead Angle	5.25°
P.C.D. (mm)	41.6
Steel Ball (mm)	ϕ 7.144
Circuits	2.5x1
Axial Play (mm)	0
Dynamic Load C (kgf)	3425
Static Load Co (kgf)	7837
Drag Torque (kgf-cm)	5.93~11.01
Spacer Ball	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
500	R40-12B1-OFSW-680-939-0.018	680	700	939	5
800	R40-12B1-OFSW-980-1239-0.018	980	1000	1239	5
1200	R40-12B1-OFSW-1380-1639-0.018	1380	1400	1639	5
1600	R40-12B1-OFSW-1780-2039-0.018	1780	1800	2039	5
2300	R40-12B1-OFSW-2480-2739-0.018	2480	2500	2739	5

3.5 Dimensions for *HIWIN* Ultra High Lead Ballscrew

DFSH TYPE (Shaft OD 16, Lead 32) Ultra High Lead

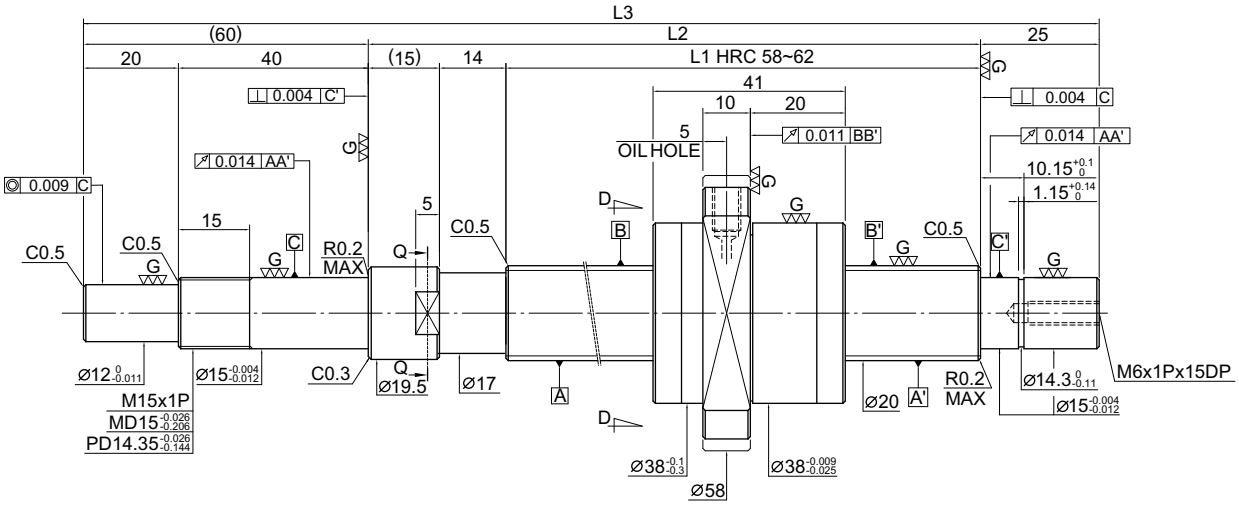


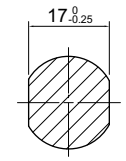
Ballscrew Data		
Direction	Right Hand	
Lead (mm)	32	
Lead Angle	31.53°	
P.C.D. (mm)	16.6	
Steel Ball (mm)	ϕ 3.175	
Circuits	0.7x2	
Axial Play (mm)	432	
Dynamic Load C (kgf)	755	
Static Load Co (kgf)	0	0.005 MAX
Drag Torque (kgf-cm)	0.15~1.0	0.24 MAX
Spacer Ball	1 : 1	-

Unit : mm

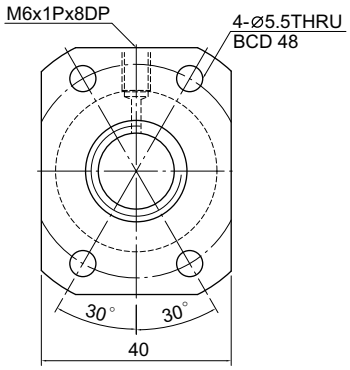
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
300	2R16-32V2-DFSH-382- 471-0.018	382	404	471	5
500	2R16-32V2-DFSH-582- 671-0.018	582	604	671	5
800	2R16-32V2-DFSH-882- 971-0.018	882	904	971	5
1200	2R16-32V2-DFSH-1282- 1371-0.018	1282	1304	1371	5

DFSH TYPE（Shaft OD 20, Lead 40） Ultra High Lead





Q-Q SECTION



D-D VIEW

Ballscrew Data		
Direction	Right Hand	
Lead (mm)	40	
Lead Angle	31.47°	
P.C.D. (mm)	80.8	
Steel Ball (mm)	ϕ3.175	
Circuits	0.7x2	
Dynamic Load C (kgf)	500	
Static Load Co (kgf)	987	
Axial Play (mm)	0	0.005 MAX
Drag Torque (kgf-cm)	0.2~1.2	0.3 MAX
Spacer Ball	-	-

Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
400	2R20-40V2-DFSH-506-620-0.018	506	535	620	5
600	2R20-40V2-DFSH-706-820-0.018	706	735	820	5
800	2R20-40V2-DFSH-906-1020-0.018	906	935	1020	5
1000	2R20-40V2-DFSH-1106-1220-0.018	1106	1135	1220	5
1200	2R20-40V2-DFSH-1306-1420-0.018	1306	1335	1420	5
1600	2R20-40V2-DFSH-1706-1820-0.018	1706	1735	1820	5

4. HIWIN Rolled Ballscrew

HIWIN rolled ballscrews manufactured by a feature a rolled screw spindle instead of one that is ground. Rolled ballscrews not only have the benefit of low friction and smooth running for a linear feeding system compared to traditional screws, but also feature quick lead times and lower production costs.

HIWIN uses the most advanced technology in the ballscrew rolling process by carefully controlling the manufacturing procedure, material selection, rolling process, heat treating, machining and assembly.

HIWIN rolled ballscrews can be classified into two grades. They are:
- Precision rolled grade (PR)
- High precision rolled grade (HR)

In general, both grades use the same preload method as precision ground ballscrews, except that there are some differences in the lead error definition and geometry tolerances. Each type of rolled ballscrew can be ordered according to the nut dimension of precision ground ballscrews. The dimensions of general type rolled ballscrews are listed in Chapter 4-4.

The geometric tolerances are shown in Table 4.4 and Table 4.6. If the ends of the spindles are unmachined, the geometric tolerance is not applied. The production scale of each type of ballscrew and the accuracy classification are described as below (the unit of length used is in mm).

4.1 Precision Rolled Ballscrews

Table 4.1 gives the lead accuracy of the precision rolled ballscrews. The lead accuracy is measured by accumulated lead error of each 300 mm section. The maximum axial play of the precision rolled ballscrew is shown in Table 4.2. These ballscrews can have the same preload as precision ground ones. The category of the precision rolled ballscrews is listed in Table 4.3, Fig. 4.1, and Table 4.4 which shows the geometric tolerance of the general rolled ballscrews. HIWIN has a variety of precision rolled ballscrews for customers' urgent requirements.

Table 4.1 : Accuracy grade of **HIWIN** precision rolled ballscrew. Unit : mm

Cumulative lead	PR1	PR2	PR3	PR4
error / 300 mm	±0.023	±0.05	±0.1	±0.21

Table 4.2 : Maximum axial play of **HIWIN** precision rolled ballscrew. Unit : mm

Ball diameter (mm)	≦2	2.381 3.175	3.969	4.763	6.35	7.144	7.938	9.525
Axial play	0.06	0.07	0.10	0.12	0.15	0.16	0.17	0.18

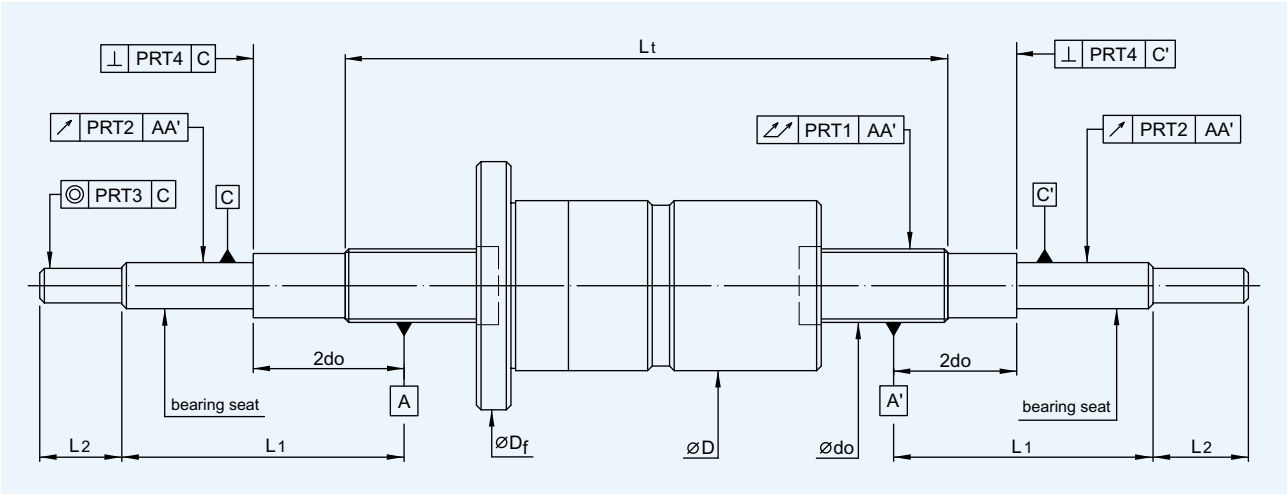


Fig. 4.1 Geometric tolerance of ***HIWIN*** precision rolled ballscrew

Table 4.3 : Category of ***HIWIN*** precision rolled ballscrew. Unit : mm

Nominal diameter do (mm)	Lead																Max.screw length
	2	2.5	3	4	5	5.08	6	8	10	12	16	20	25	32	40	50	
8	●	■	●														800
10	●	■	●	●	●												1000
12	●	■	●	■	●	●				●							1200
14		■	●	●	●												1400
15					●				●			●					1500
16	■	■			■	■			■		●						1600
20		■			■	■	●	●	●			●					2000
25					■	■		●	■				●				2500
28					●		●							●			2500
32					■	■	●	●	●			●					3200
36					●	●	●	●	●	●		●					3600
40					■	■	●	●	●	●		●			●		4000
45									●	●		●					4600
50					●		●		●	●	●	●			●	●	5000
55									●								5500
63									■		●	■			●		5750

■ : Right and left hand ballscrews ● : Right hand ballscrews only

Table : 4.4 Geometric tolerance range of ***HIWIN*** precision rolled ballscrew Unit : μm

Nominal diameter do (mm)	PRT1					PRT2			PRT3			PRT4
	Lt / do					L1			L2			
	≤ 20	≤ 40	≤ 60	≤ 80	≤ 100	< 50	< 125	< 200	< 50	< 125	< 200	
12/14	60	80	120	200	320	40	-		12	-	-	6
16	60	80	120	200	320	40	-	-	12	-	-	6
20	60	80	120	200	320	40	50	-		16	-	6
25/28	60	80	120	200	320	40	50	-		16	-	6
32/36	60	80	120	200	320	40	50	-		16	-	6
40/45	60	80	120	200	320	40	50	-		16	-	6
50	60	80	120	200	320	40	50	63			20	6
63	60	80	120	200	320	40	50	63			20	8

* Note : The geometric tolerance of grade PR4 is not included.

4.2 High Precision Rolled Ballscrews

The lead accuracy of the high precision rolled ballscrew is shown in table 4.5.

Fig. 4.2 and Table 4.6 show the geometrics tolerance of preloaded high precision rolled ballscrews. Since outside spindles of these ballscrews are made to meet accuracy tolerances, the geometric tolerance can be maintained at the highest precision level. The preload method of this type is the same as that of precision ground type. Therefore it is comparable to the relative grade precision ground ballscrew with a lower cost and shorter lead time.

Table 4.7 gives the standard axial backlash of non-preloaded high precision rolled ballscrews. Table 4.8 shows the high precision rolled ballscrew. Since the rolled ballscrews have different heat treatment processes, it is harder to machine by regular machine methods. HIWIN will machine the journal ends to your specifications.

Table 4.5 Lead accuracy of ***HIWIN*** high precision rolled ballscrew Unit : μm

Accuracy Grade		HR1	
Thread length (mm) / Item		±E	e
above	below		
-	315	23	23
315	400	25	25
400	500	27	26
500	630	30	29
630	800	35	31
800	1000	40	35
1000	1250	46	39
1250	1600	54	44
1600	2000	65	51
2000	2500	77	59
2500	2800	93	69

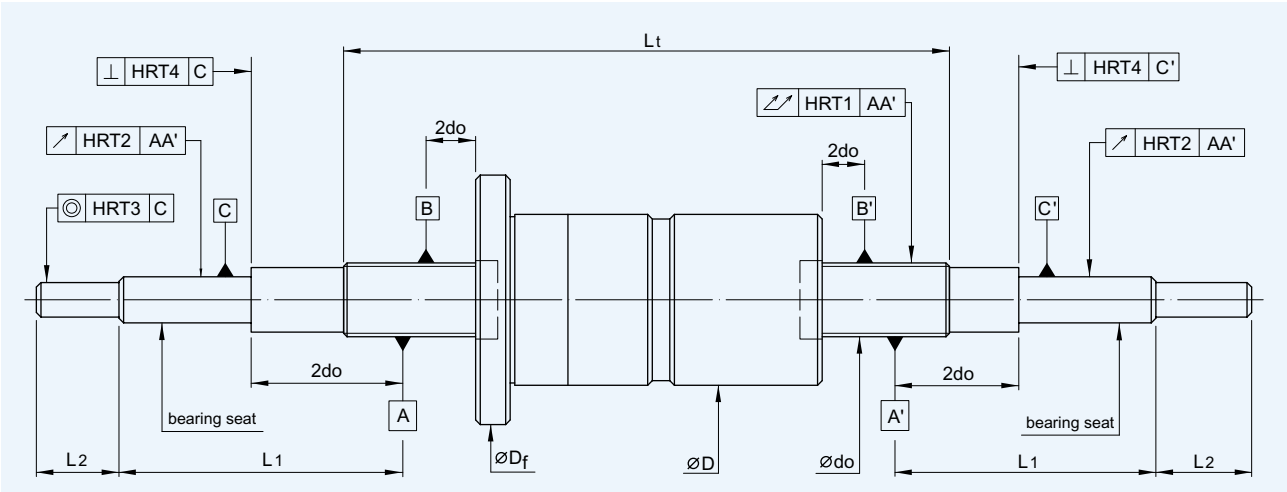


Fig. 4.2 Geometric tolerance of ***HIWIN*** high precision rolled ballscrew

Table 4.6 Geometric tolerance range of ***HIWIN*** high precision rolled ballscrew Unit : μm

Nominal diameter do (mm)	HRT1		HRT2			HRT3			PRT4
	Lt/do		L1			L2			
	≤ 20	≤ 40	< 50	< 125	< 200	< 50	< 125	< 200	
16	50	64	25	-	-	10	-	-	5
20	50	64	25	32	-		12	-	5
25	50	64	25	32	-		12	-	5
32	50	64	25	32	-		12	-	5
40	50	64	25	32	-		12	-	5
50	50	64	25	32	40		-	16	5

Table 4.7 Axial play of standard non-preloaded high precision rolled ballscrews Unit : mm

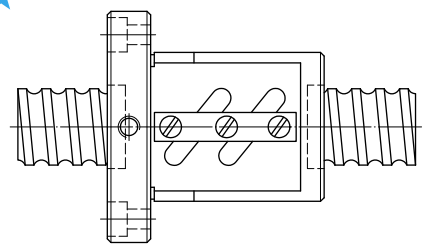
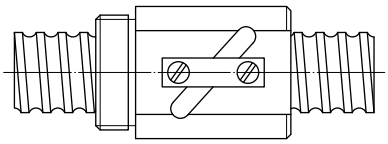
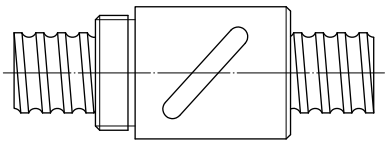
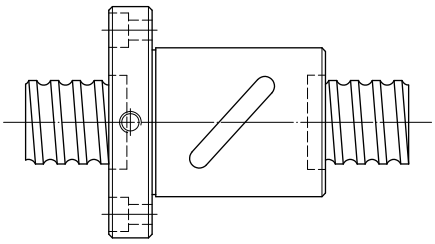
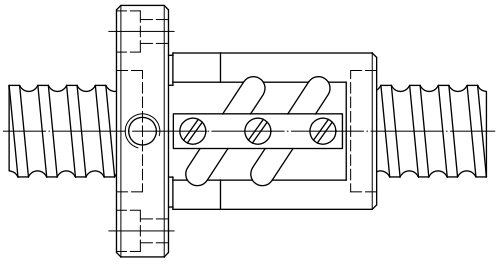
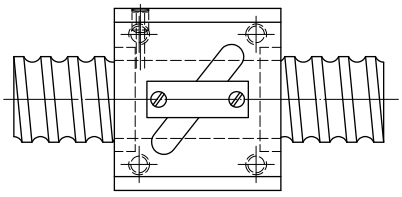
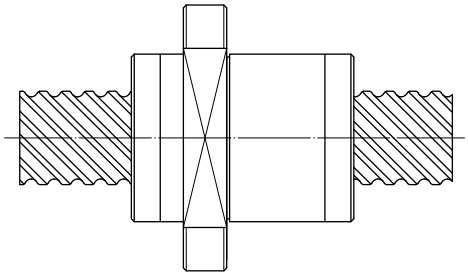
Accuracy grade	HR1
Max. axial play	0.02

Table 4.8 Category of the high precision rolled ballscrews Unit : mm

Nominal diameter do (mm)	Lead		Max.screw length
	5	10	
16	■		640
20	■		800
25	■	●	1000
32	■	●	1200
40	■	●	1600
50		●	3000

■ : Right and left hand ballscrews ● : Right hand ballscrews only

5. Dimensions for *HIWIN* Rolled Ballscrews

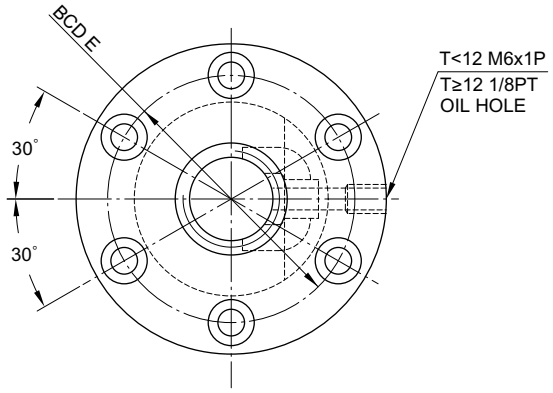
page	General Type		page
138	★★ **FSW**  Flange end, Single nut, Tube within the nut diameter	**RSV**  Round, Single nut, Tube above the nut diameter	139
140	**RSB**  Round, Single nut, Bonded return tube	★★ **FSB**  Flange end, Single nut, Bonded return tube	141
142	★★ **FSV**  Flange end, Single nut, Tube above the nut diameter	**SSV**  Square, single nut, Tube above the nut diameter	143
page	**High Lead Type**		**page**
144	★★ **FSH**  Large lead,Flange mounted, Single nut, End cap		144

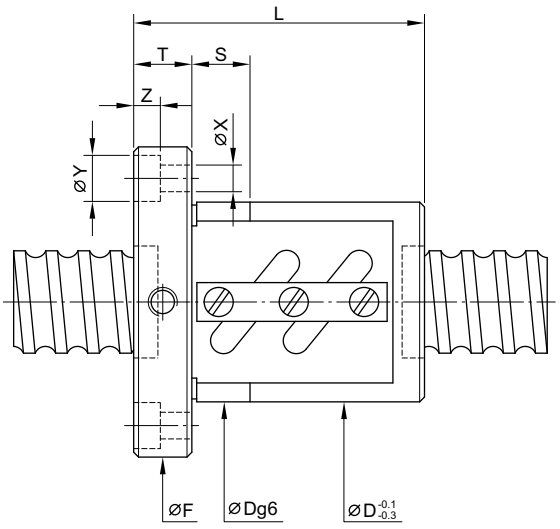
*Different design required by the drawing approval, please contact with HIWIN engineers for the other type listed above.

*Double asterisks(★★): Self-Lubricating Ballscrew E1 design is available, except the shaft diameter under 16mm or ball diameter under 2.381mm.

5.1 Dimensions for *HIWIN* Rolled Ballscrews

FSW TYPE — Standard

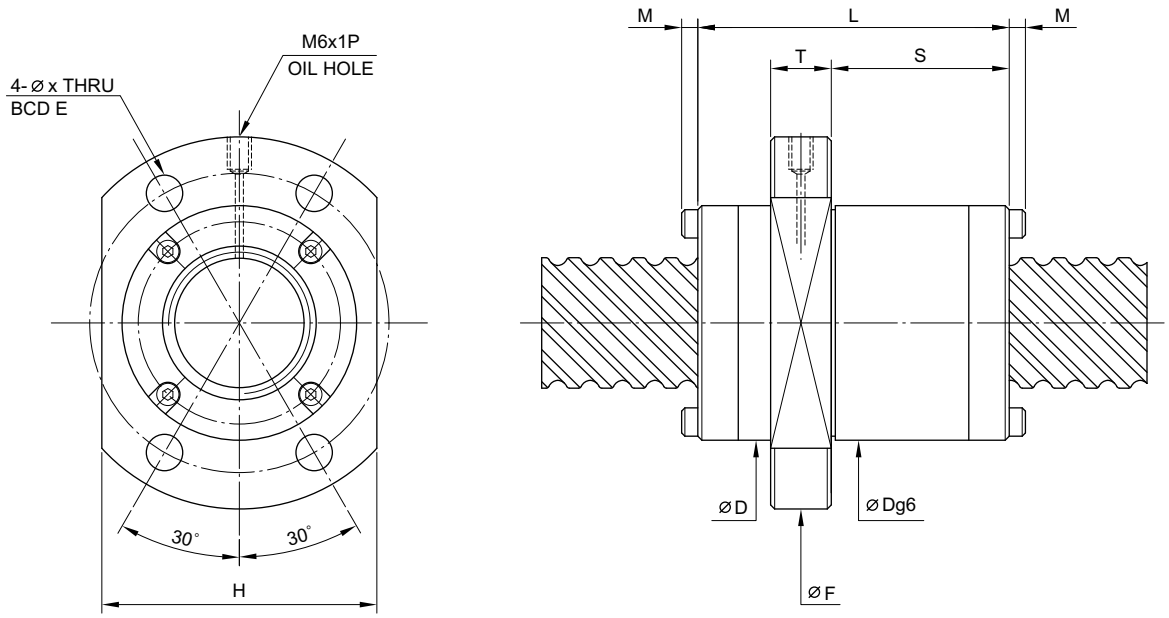




Model	Size		Ball Dia.	Circuits	Dynamic Load $1x10^6$ revs C (kgf)	Static Load Co (kgf)	Nut		Flange						Fit
	Nominal Dia.	Lead					L	D	F	BCD-E	T	Bolt			
												X	Y	Z	S
8-2.5B1	8	2.5	2.000	2.5x1	218	317	34	26	47	35	8	5.5	9.5	5.5	8
10-2.5B1	10			2.5x1	252	405	34	28	52	38	8	5.5	9.5	5.5	8
10-4B1		4	2.381	2.5x1	304	466	41	30	53	41	10	5.5	9.5	5.5	10
12-4B1	12			2.5x1	344	574	41	30	50	40	10	5.5	9.5	5.5	12
16-5B1	16	5	3.175	2.5x1	679	1226	43	40	64	51	10	5.5	9.5	5.5	12
20-5C1	20			3.5x1	1001	2149	50	44	68	55	12	5.5	9.5	5.5	12
25-5B2	25			2.5x2	1534	3975	60	50	74	62	12	5.5	9.5	5.5	12
25-10B1		10	4.763	2.5x1	1459	2983	65	60	86	73	16	6.6	11	6.5	12
32-5B2	32	5	3.175	2.5x2	1702	5098	60	58	84	71	12	6.6	11	6.5	12
32-10B2		10	6.350	2.5x2	4379	10345	98	74	108	90	16	9	14	8.5	15
40-10B2	40			2.5x2	4812	12732	102	84	125	104	18	11	17.5	11	15
50-10C2	50			3.5x2	7146	22477	126	94	135	114	18	11	17.5	11	20
63-10C2	63			3.5x2	7869	28290	128	110	152	130	20	11	17.5	11	20

FSH TYPE

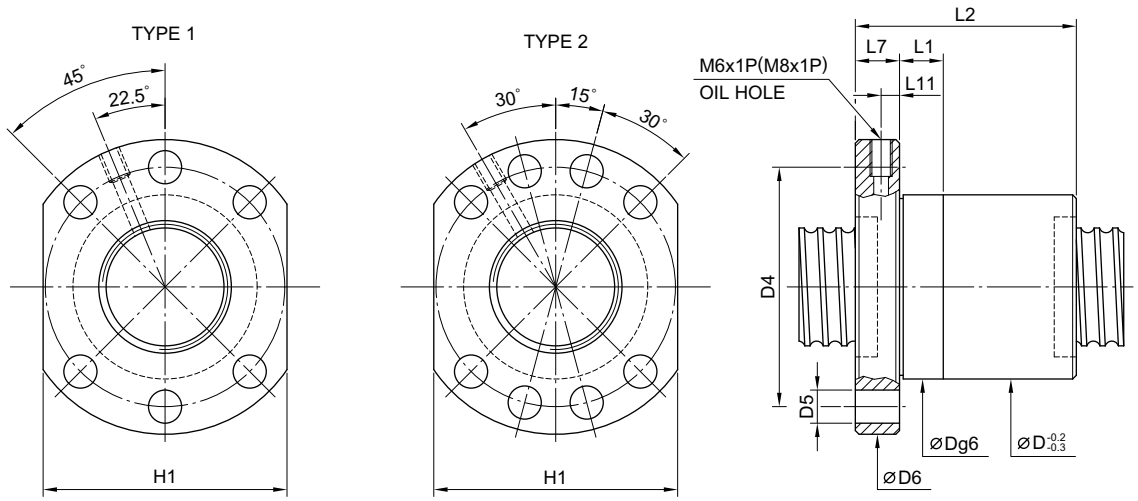
High Lead



Model	Size		Ball Dia.	Circuits	Dynamic Load $1x10^6$ revs C (kgf)	Static Load Co (kgf)	Nut		Flange				Bolt	Fit	
	Nominal Dia.	Lead					D	L	F	T	BCD-E	H	X	S	M
16-16S2	16	16	3.175	1.8x2	710	1380	32	48	53	10	42	38	4.5	26	0
16-16S4				1.8x4	1290	2760									
16-16S2				1.8x2	710	1380	33	48	58	10	45	38	6.6	26	0
16-16S4				1.8x4	1290	2760									
20-20S2	20	20		1.8x2	800	1740	39	48	62	10	50	46	5.5	27.5	0
20-20S2				1.8x2	800	1740	38	58	62	10	50	46	5.5	32.5	3
20-20S4				1.8x4	1450	3480									
25-25S2	25	25	3.969	1.8x2	1210	2800	47	67	74	12	60	56	6.6	39.5	3
25-25S4				1.8x4	2190	5600									
32-32S2	32	32	4.763	1.8x2	1720	4280	58	85	92	15	74	68	9	48	0
32-32S4				1.8x4	3110	8530									
40-40S2	40	40	6.350	1.8x2	2810	7170	72	102	114	17	93	84	11	60	0
40-40S4				1.8x4	5100	14330									
50-50S2	50	50	7.938	1.8x2	4120	10890	90	125	135	20	112	104	14	83.5	0
50-50S4				1.8x4	7470	21780									

6. Dimensions for *HIWIN* Stock Rolled Ballscrews

FSI TYPE (DIN 69051 part 5 form B) Stock

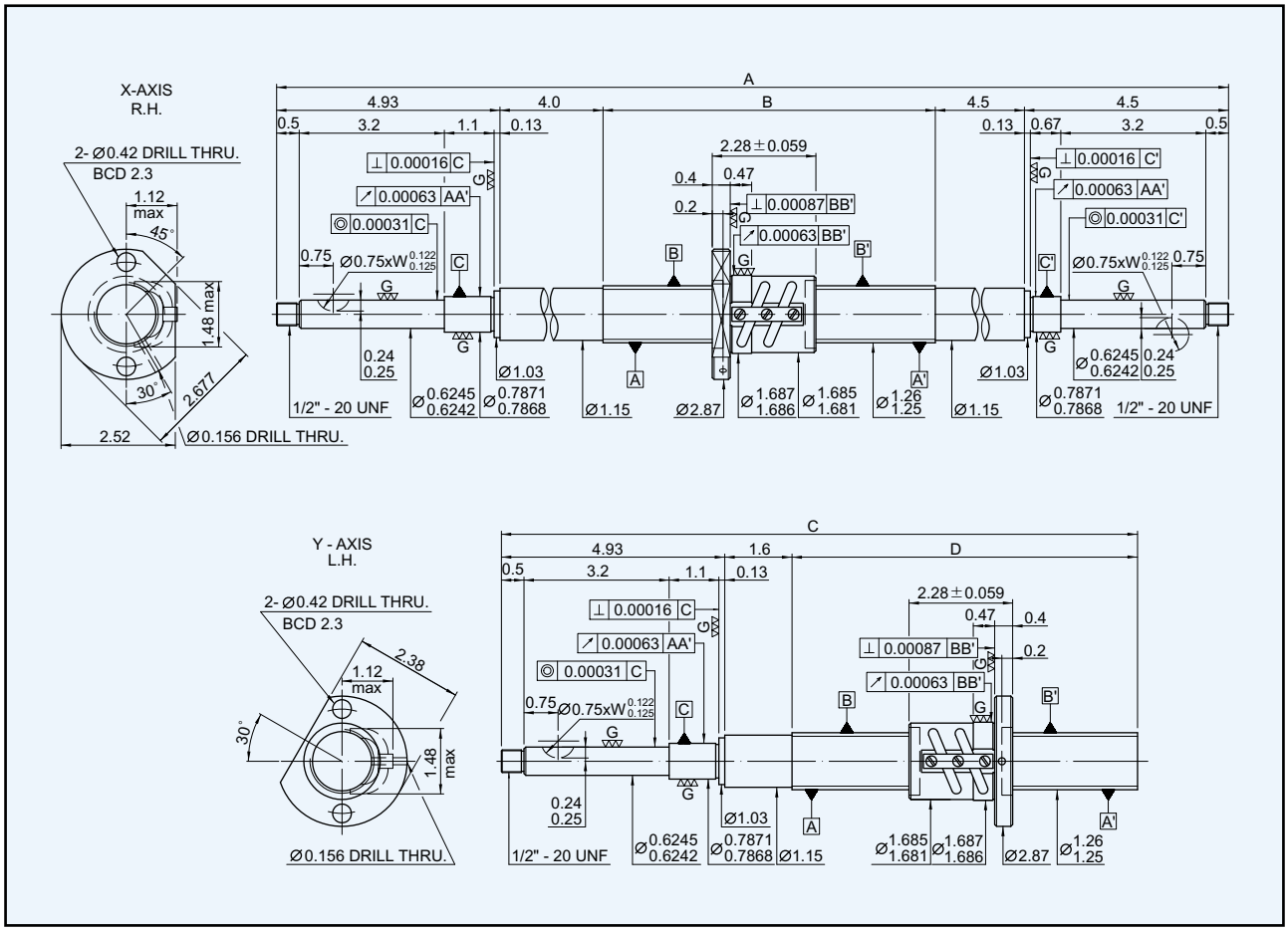


Model	Size		Ball Dia.	Circuits	Dynamic Load $1x10^6$ revs C (kgf)	Static Load Co (kgf)	D	D4	Flange Hole No.	D5	D6	H1	L1	L2	L7	L11	M-Oil Hole
	Nominal Dia.	Lead															
16-5T3	16	5	3.175	3	664	1196	28	38	6	5.5	48	40	10	44	10	5	M6x1P
20-5T3	20			3	733	1495	36	47	6	6.6	58	44	10	44	10	5	M6x1P
20-5T4				4	939	1993	36	47	6	6.6	58	44	10	52	10	5	M6x1P
25-5T3	25			3	880	2082	40	51	6	6.6	62	48	10	44	10	5	M6x1P
25-5T4				4	1127	2776	40	51	6	6.6	62	48	10	52	10	5	M6x1P
25-10T3		10	4.763	3	1430	2914	40	51	6	6.6	62	48	16	74	10	5	M6x1P
32-5T3	32	5	3.175	3	1008	2773	50	65	6	9	80	62	10	46	12	6	M6x1P
32-5T4				4	1291	3697	50	65	6	9	80	62	10	53	12	6	M6x1P
32-5T6				6	1830	5545	50	65	6	9	80	62	10	66	12	6	M6x1P
32-10T3		10	6.350	3	2264	4803	50	65	6	9	80	62	16	74	12	6	M6x1P
32-10T4				4	2900	6404	50	65	6	9	80	62	16	85	12	6	M6x1P
40-5T4	40	5	3.175	4	1414	4621	63	78	8	9	93	70	10	53	14	7	M8x1P
40-5T6				6	2004	6932	63	78	8	9	93	70	10	66	14	7	M8x1P
40-10T3		10	6.350	3	2652	6367	63	78	8	9	93	70	16	74	14	7	M8x1P
40-10T4				4	3396	8489	63	78	8	9	93	70	16	87	14	7	M8x1P
50-5T4	50	5	3.175	4	1562	5940	75	93	8	11	110	85	10	57	16	8	M8x1P
50-5T6				6	2214	8910	75	93	8	11	110	85	10	70	16	8	M8x1P
50-10T3		10	6.350	3	3045	8334	75	93	8	11	110	85	16	78	16	8	M8x1P
50-10T4				4	3899	11112	75	93	8	11	110	85	16	89	16	8	M8x1P
50-10T6				6	5526	16668	75	93	8	11	110	85	16	112	16	8	M8x1P

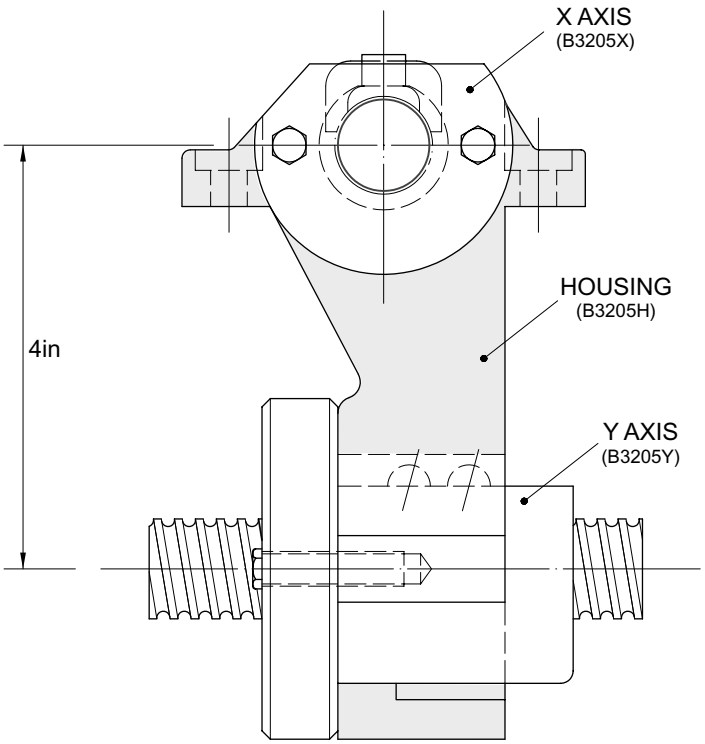
7. Ballscrew Retrofit Kits for Manual Milling Machines

7.1 Precision Ground Ballscrew Set

1. Precision ground, lead accuracy within ±0.0005” /ft.
2. Stock size meet various CNC systems’ requirements.
3. High strength and long service life.



Precision ground ballscrew set



Traverse Screw (X Axis) in			
Traverse Screw	A	B	Part Number
32	42	24.07	B3205X-32
36	46	28.07	B3205X-36
42	52	34.07	B3205X-42
48	58	40.07	B3205X-48

Crossfeed Screw (Y Axis) in.			
Table Size	C	D	Pare Number
9	20.3	13.77	B3205Y-9
12	23.3	16.77	B3205Y-12
16	27.3	20.77	B3205Y-16

P.C.Dia.	1.28"
Ball Dia.	0.125"
Lead Angle	2.84°
Circuits	2.5x2
Lead	5TPI
Static Load	12491 lbf
Dynamic Load($1x10^6$revs)	4158 lbf
Lead Accuracy	0.0003"/2π; 0.0005"/ft
Drag Torque(Preload)	3.5in-lb (280lbs)

8. Multi-Solutions

8.1 E1 Self - lubricant cartridge

China Patent No. 364546
Germany Patent No. 29920112.0
Japan Patent No. 3066118
Taiwan Patent No.200310
U.S.A. Patent No. 6247556

E1 : Economy first & Ecology first

Specification number :

Example:

R40 - 10B2 - FSW**E1** - 800 - 1000 - 0.008

↓

HIWIN E1 code

Specification :

- **Nut type: FSV, FDV, FSW, FDW, PFDW, OFSW, DFSV, FSH**
- Please contact HIWIN engineers with other specifications you may need.
- In order to achieve lubrication efficiency; please notify HIWIN engineers of the ballscrew installation direction.

8.2 R1 Rotating Nut

China Patent No. 422327
Germany Patent No. 10108647.4
Taiwan Patent No.166845
U.S.A. Patent No. 6406188B1

Application:

Semi-conductor industries, Robots,
Wood working machines, Laser cutting machines,
Transporting equipment.

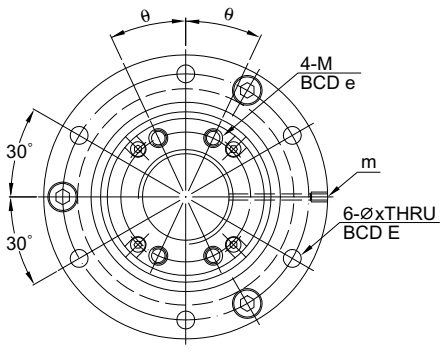
Specification:

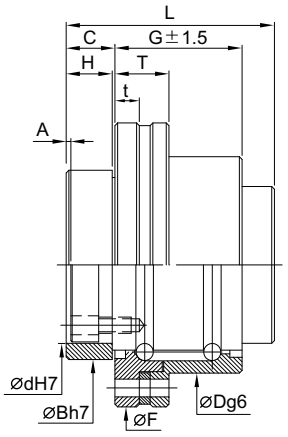
Example:

2R40-40S2-DFSH**R1**-800-1000-0.018

↓

HIWIN R1 code





Model	Bearing		Nut				Flange			Bolt					Bush				Oil hole
	Dynamic Load(kgf)	Static Load(kgf)	D	G	L	C	F	T	t	BCD-E	BCD-e	θ	M	X	d	B	H	A	
16-16S2	1299	1826	52	25	44	11.4	68	13	6	60	26	20	M4x0.7P	4.5	33	40	11	2	M4x0.7P
20-20S2	1762	2531	62	30	50	12	78	13	6	70	31	20	M5x0.8P	4.5	39	50	11	2	M4x0.7P
25-25S2	1946	3036	72	37	63	16.5	92	13	6	81	38	20	M6x1P	5.5	47	58	15.5	3	M4x0.7P
32-32S2	3150	5035	80	47	80	21	105	20	9	91	48	25	M6x1P	6.6	58	66	20	3	M6x0.75P
40-40S2	4800	8148	110	62	98	22.5	140	20	9	123	61	25	M8x1.25P	9	73	90	21.5	3	M6x0.75P

8.3 High Load Drive

Application:

High-load ball screw can be used for application on injection molding machines, die casting machines, general presses, power cylinders, robots, etc.

Features:

1. Heavy Load

A. 2~3 times greater load capacity than general standard series.

B. High axial load and acceleration.

C. Special lubrication design for short stroke.

2. Accuracy

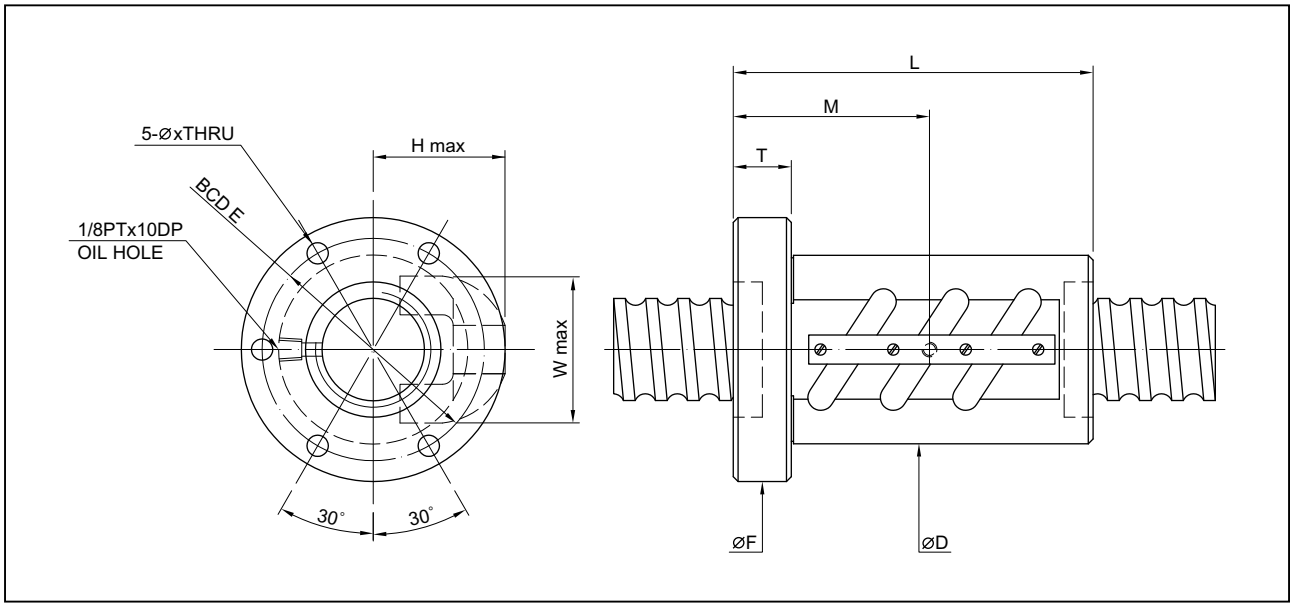
JIS C5 and JIS C7

3. High Speed Operation and Long Life

Enforced ball circulation systems for high speed operation and to achieve longer service life.

4. Option

HIWIN Self-lubricant E1 Series.



Model No.	Shaft diameter	Lead	Turns Circuits	Dynamic C N (kgf)		Static Co N (kgf)		D	L	F	T	E	X	H	W	M
50-16B2	50	16	2.5x2	235	(24000)	497	(50700)	95	165	127	28	110	9	68	69	101
50-16B3			2.5x3	334	(34100)	746	(76100)	95	213	127	28	110	9	68	69	117
55-16B2	55		2.5x2	255	(26000)	535	(54600)	100	165	132	28	115	9	71	74	101
55-16B3			2.5x3	361	(36800)	804	(82000)	100	213	132	28	115	9	71	74	117
63-16B2	63		2.5x2	280	(28600)	613	(62500)	105	165	137	28	120	9	73	82	101
63-16B3			2.5x3	398	(40600)	918	(93700)	105	213	137	28	120	9	73	82	117
80-16B2	80		2.5x2	322	(32900)	765	(78100)	120	170	158	32	139	11	81	98	106
80-16B3			2.5x3	458	(46700)	1150	(117000)	120	218	158	32	139	11	81	98	122
80-25B3		25	2.5x3	650	(66300)	2010	(205000)	145	338	185	40	165	11	102	100	140
100-16B3	100	16	2.5x3	493	(50300)	1430	(146000)	140	218	178	32	159	11	91	117	122
100-25B3		25	2.5x3	738	(75300)	2596	(264900)	159	338	199	40	179	11	109	118	140
100-25B4			2.5x4	945	(96400)	3461	(353200)	159	413	199	40	179	11	109	118	165

8.4 Cool Type

● Design Principle:

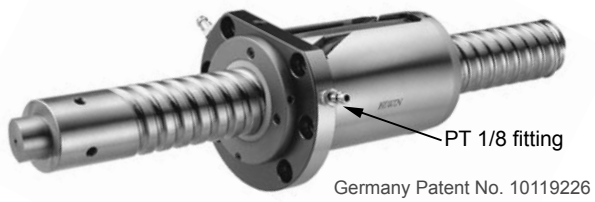
The Cool Type series feature using forced cooling fluid to pass through the nut, minimizes heat generation and thermal expansion during ballscrew operation.

● Cool Type I as shown in Figure 8.1:

Cooling fluids are circulated in passages that inside the nut, and remove heat as shown in Figure 8.2 In cooperation with the hollow shaft design, it offers high thermal control and maintains high accuracy. This combination is the most suitable for high-speed machine tools.

● Cool Type II as shown in Figure 8.3:

Flowing fluids are circulated through a space, Inside the nut, and remove heat as shown in Figure 8.4. It is the most suitable for electric-driven injection molding machines, presses, and power units. The Cool type II, compared with the standard specifications, will make a minor external dimension change to the nut. Please contact ***HIWIN*** for exact dimensions.



Germany Patent No. 10119226

Fig. 8.1 Cool Type I

Germany Patent No. 20119457.0
Taiwan Patent No. 193878

Fig. 8.3 Cool Type II

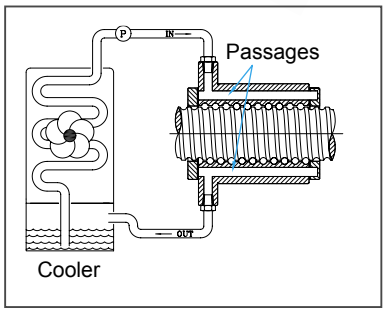


Fig. 8.2 Cool Type I with cooler

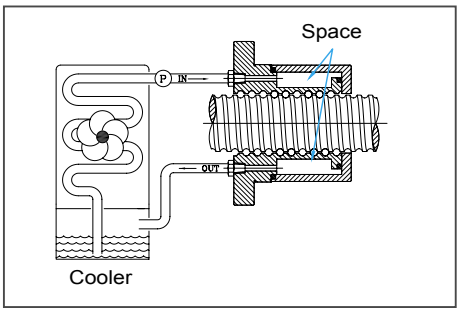


Fig. 8.4 Cool Type II with cooler

Features:

1. Optimized design for high reliability

Using computer simulation and FEM analysis, the Cool Type ballscrew features excellent thermal protection and high reliability.

2. Higher speed rotation and extra high Dm-N value (up to 200,000)

Cool Type ballscrews will reduce high-speed rotation aftereffect, problems.

3. Prevent thermal distortion

Optimized heat transfer design minimizes heat generation and prevents thermal distortion.

4. Strengthen durability

During extended operation, ball-to-ball friction generates heat that in turn reduces service life. Cool Type ballscrews minimize heat buildup and therefore are more durable.

5. Extended lubricant life cycle

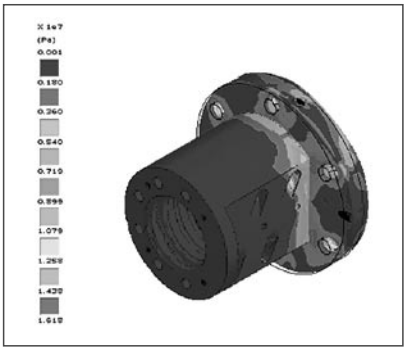
A reduction in heat generation also prevents lubrication breakdown - which, in turn, extends the lubricant life.

6. Keep temperature uniform and reduce warm-up time

Warm-up time is reduced because the cooling system keeps the nut and shaft at a constant temperature.

7. Higher feeding accuracy

The cooling effect of the Cool Type ballscrew protects against thermal expansion that would normally effect feeding accuracy.



FEM analysis for Cool Type ballscrew

Application:

Cool Type 1 and a hollow shaft design:

High speed machine tools and machining centers.

Cool Type 2 :

Electric-driven injection molding machines, presses, power units and other replaceable hydraulic drives.

Specification:

1. We recommend shaft diameter above ø32mm for the Cool Type
2. Nut type: FSV, FSW, PFDW, OFSW, DFSV, FSH, FSI, etc.
3. Please contact HIWIN with other specifications you may need.
4. The Cool Type II, compared with the standard specifications, will have a minor external dimension change to the nut, please contact HIWIN for exact dimensions..

Specification number:

Example: R50 - 30C1 - OFSWC1 - 1180 - 1539 - 0.008

↓

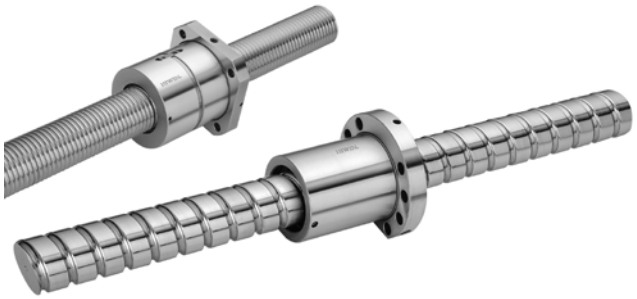
C1: ***HIWIN*** Cool Type ballscrew for type I

Example: R63 - 16B3 - RSWC2 - 400 - 600- 0.05

↓

C2: ***HIWIN*** Cool Type ballscrew for type II

8.5 Super S



Pattern Nomenclature:

Ex: R40-10K4 -FSC -1200 -1600 - 0.008

- 4 turns
- Cassette type
- Single nut
- Nut with flange

Performance:

Specification: 2R40 - 40K4 - DFSC - 1200 -1600 - 0.008
Lead: 40 mm
Acceleration: 1g (9.8m/sec2)
Dm-N Value: 120,000

Application:

CNC Machinery, Industrial Machinery, Electronic Machinery, Precision Machines and other High Speed Machinery.

Features:

1.Low noise (5~7dB lower than traditional series)

The patented design of the return unit will reduce noises caused by the impact of the ballnut's balls, greatly reducing the noise intensity.

2.Space-saving and lightweight design

The ballnut diamenter is 18%~32% smaller than traditional series.

3.Dm-N value up to 180,000

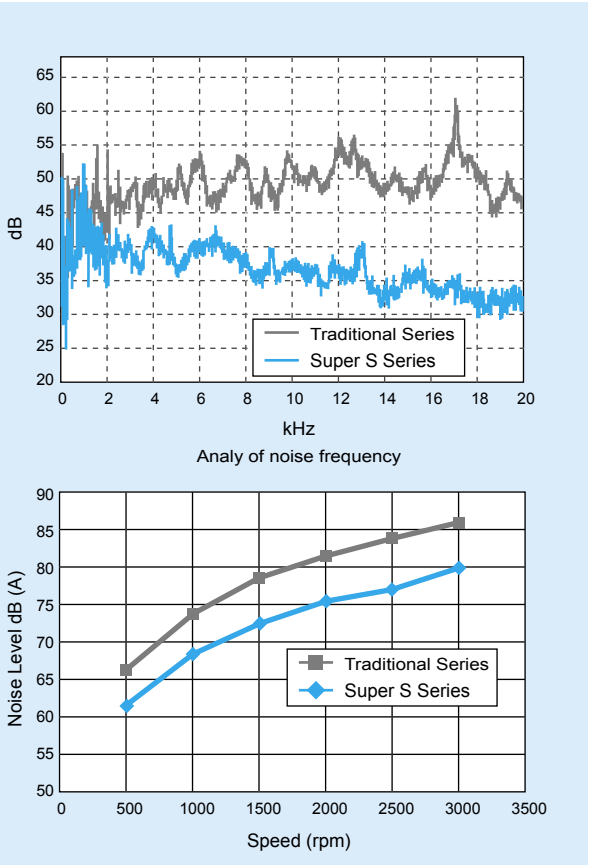
The patented design of the return unit improves the strength of the return structure, achieving a Dm-N value of up to 180,000.

4.High acceleration and deceleration velocity

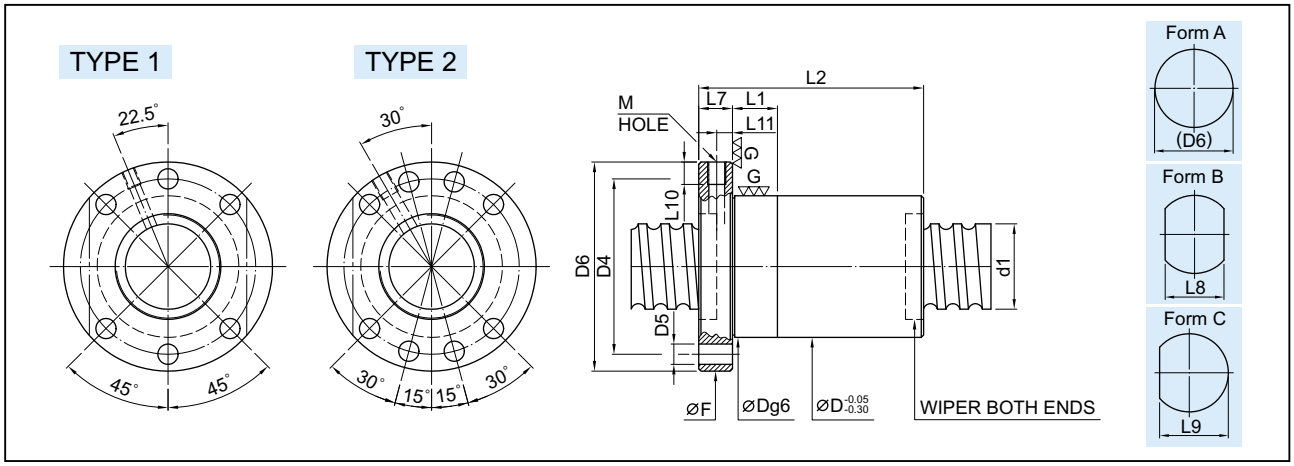
The pathway of the specialized return unit, as well as the ballnut's strengthened design diminish the impact experienced by the balls, Therefore, it can sustain peak performance in more rigorous operating environments, such as high acceleration and deceleration.

5.Accuracy grade

Precision ground ballscrews available in JIS Grade C0~C7; Rolled ballscrews available in JIS Grade C6~C10.

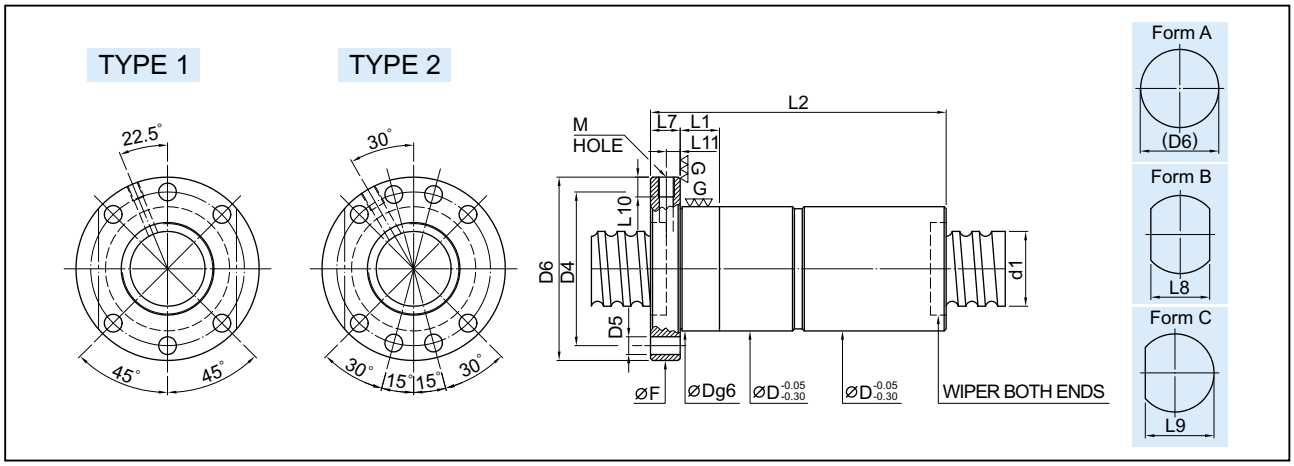


FSC TYPE



Model	Size		Ball Dia.	Circuits	Dynamic Load 1x10⁶ revs C(kgf)	Static Load Co(kgf)	Nut			Flange							Bolt		
	Nominal Dia.	Lead					D	L1	L2	TYPE	Form A (D6)	Form B (L8)	Form C (L9)	L7	D4	D5	M	L10	L11
20-10K3	20	10	3.175	K3	1134	2660	36	16	48	1	58	44	51	12	47	6.6	M6x1P	8	6
20-20K2		20		K2	766	1736	36	25	57	1	58	44	51	12	47	6.6	M6x1P	8	6
25-25K2	25	25		K2	845	2174	40	30	70	1	62	48	55	12	51	6.6	M6x1P	8	6
32-10K5	32	10	6.350	K5	5641	14488	57	20	77	1	87	69	78	13	72	9	M6x1P	8	6
32-12K5		12		K5	5630	14460	57	25	87	1	87	69	78	13	72	9	M6x1P	8	6
32-16K4		16		K4	4573	11390	57	20	90	1	87	69	78	13	72	9	M6x1P	8	6
32-20K3		20		K3	3488	8340	57	25	87	1	87	69	78	13	72	9	M6x1P	8	6
32-20K4				K4	4535	11318	57	25	107	1	87	69	78	13	72	9	M6x1P	8	6
32-20K3			3.969	K3	1904	5438	50	25	88	1	80	62	71	13	65	9	M6x1P	8	6
32-20K4				K4	2476	7380	50	25	108	1	80	62	71	13	65	9	M6x1P	8	6
32-32K2		32		K2	1288	3532	50	40	88	1	80	62	71	13	65	9	M6x1P	8	6
36-10K4	36	10	6.350	K4	4917	13022	61	16	70	2	91	68	79.5	15	76	9	M8x1P	10	7
36-10K5				K5	6011	16449	61	20	80	2	91	68	79.5	15	76	9	M8x1P	10	7
36-12K4		12		K4	4907	13002	61	20	75	2	91	68	79.5	15	76	9	M8x1P	10	7
36-12K5				K5	5998	16423	61	25	87	2	91	68	79.5	15	76	9	M8x1P	10	7
36-36K2		36		K2	2541	6548	61	40	95	2	91	68	79.5	15	76	9	M8x1P	10	7
40-6K6	38	6	3.969	K6	3852	13320	63	10	58	2	93	70	81.5	15	78	9	M8x1P	10	7
40-10K4		10	6.350	K4	5056	13798	63	16	70	2	93	70	81.5	15	78	9	M8x1P	10	7
40-10K5				K5	6181	17429	63	20	80	2	93	70	81.5	15	78	9	M8x1P	10	7
40-10K6				K6	7273	21060	63	20	90	2	93	70	81.5	15	78	9	M8x1P	10	7
40-12K4		12		K4	5046	13778	63	20	75	2	93	70	81.5	15	78	9	M8x1P	10	7
40-12K5				K5	6169	17404	63	25	87	2	93	70	81.5	15	78	9	M8x1P	10	7
40-12K6				K6	7260	21030	63	25	99	2	93	70	81.5	15	78	9	M8x1P	10	7
40-16K4		16		K4	5023	13729	63	20	90	2	93	70	81.5	15	78	9	M8x1P	10	7
40-16K5				K5	6141	17341	63	25	106	2	93	70	81.5	15	78	9	M8x1P	10	7
40-20K4		20		K4	4993	13666	63	25	108	2	93	70	81.5	15	78	9	M8x1P	10	7
40-20K5				K5	6104	17262	63	25	128	2	93	70	81.5	15	78	9	M8x1P	10	7
40-40K2		40		K2	2590	6568	63	45	102	2	93	70	81.5	15	78	9	M8x1P	10	7
45-6K6	45	6	3.969	K6	4173	16084	68	10	58	2	98	75	86.5	15	83	9	M8x1P	10	7
45-16K4		16	6.350	K4	5548	16818	70	20	93	2	105	80	92.5	18	88	11	M8x1P	10	9
45-16K5				K5	6783	21244	70	25	109	2	105	80	92.5	18	88	11	M8x1P	10	9
45-20K4		20		K4	5524	16762	70	25	108	2	105	80	92.5	18	88	11	M8x1P	10	9
45-20K5				K5	6753	21173	70	25	128	2	105	80	92.5	18	88	11	M8x1P	10	9
50-10K4	50	10	6.350	K4	5769	18450	75	16	70	2	110	85	97.5	18	93	11	M8x1P	10	9
50-10K6				K6	8299	28161	75	20	90	2	110	85	97.5	18	93	11	M8x1P	10	9
50-12K4		12		K4	5763	18435	75	25	81	2	110	85	97.5	18	93	11	M8x1P	10	9
50-12K6				K6	8290	28138	75	25	105	2	110	85	97.5	18	93	11	M8x1P	10	9
50-16K4		16		K4	5747	18396	75	20	96	2	110	85	97.5	18	93	11	M8x1P	10	9
50-16K6				K6	8267	28078	75	25	128	2	110	85	97.5	18	93	11	M8x1P	10	9
50-20K4		20		K4	5727	18346	75	25	112	2	110	85	97.5	18	93	11	M8x1P	10	9
50-20K6				K6	8238	28001	75	25	152	2	110	85	97.5	18	93	11	M8x1P	10	9
50-25K4		25		K4	5695	18268	75	30	129	2	110	85	97.5	18	93	11	M8x1P	10	9
50-25K6				K6	8193	27883	75	30	179	2	110	85	97.5	18	93	11	M8x1P	10	9
50-40K2		40		K2	3004	8840	75	45	109	2	110	85	97.5	18	93	11	M8x1P	10	9
50-40K3				K3	4392	13750	75	45	149	2	110	85	97.5	18	93	11	M8x1P	10	9
55-6K6	55	6	3.969	K6	4527	19779	102	10	60	2	144	102	128	18	122	11	M8x1P	10	9

FDC TYPE

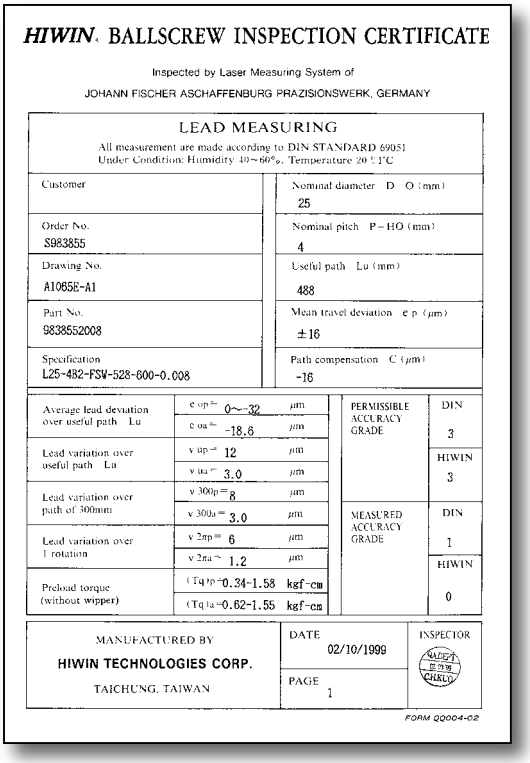


Model	Size		Ball Dia.	Circuits	Dynamic Load $1x10^4$ revs C(kgf)	Static Load Co(kgf)	Nut			Flange							Bolt		
	Nominal Dia.	Lead					D	L1	L2	TYPE	Form A (D6)	Form B (L8)	Form C (L9)	L7	D4	D5	M	L10	L11
20-10K3	20	10	3.175	K3	1134	2660	36	16	99	1	58	44	51	12	47	6.6	M6x1P	8	6
20-20K2		20		K2	766	1736	36	25	117	1	58	44	51	12	47	6.6	M6x1P	8	6
25-25K2	25	25		K2	845	2174	40	30	143	1	62	48	55	12	51	6.6	M6x1P	8	6
32-10K5	32	10	6.350	K5	5641	14488	57	20	158	1	87	69	78	13	72	9	M6x1P	8	6
32-12K5		12		K5	5626	14459	57	25	178	1	87	69	78	13	72	9	M6x1P	8	6
32-16K4		16		K4	4573	11390	57	20	184	1	87	69	78	13	72	9	M6x1P	8	6
32-20K3		20		K3	3488	8340	57	25	178	1	87	69	78	13	72	9	M6x1P	8	6
32-20K4				K4	4535	11318	57	25	218	1	87	69	78	13	72	9	M6x1P	8	6
32-20K3			3.969	K3	1904	5438	50	25	180	1	80	62	71	13	65	9	M6x1P	8	6
32-20K4				K4	2476	7380	50	25	220	1	80	62	71	13	65	9	M6x1P	8	6
32-32K2		32		K2	1288	3532	50	40	180	1	80	62	71	13	65	9	M6x1P	8	6
36-10K4	36	10	6.350	K4	4917	13022	61	16	144	2	91	68	79.5	15	76	9	M8x1P	10	7
36-10K5				K5	6011	16449	61	20	164	2	91	68	79.5	15	76	9	M8x1P	10	7
36-12K4		12		K4	4907	13002	61	20	154	2	91	68	79.5	15	76	9	M8x1P	10	7
36-12K5				K5	5998	16423	61	25	178	2	91	68	79.5	15	76	9	M8x1P	10	7
36-36K2		36		K2	2541	6548	61	40	194	2	91	68	79.5	15	76	9	M8x1P	10	7
40-6K6	38	6	3.969	K6	3852	13320	63	10	120	2	93	70	81.5	15	78	9	M8x1P	10	7
40-10K4		10	6.350	K4	5056	13798	63	16	144	2	93	70	81.5	15	78	9	M8x1P	10	7
40-10K5				K5	6181	17429	63	20	164	2	93	70	81.5	15	78	9	M8x1P	10	7
40-10K6				K6	7273	21060	63	20	184	2	93	70	81.5	15	78	9	M8x1P	10	7
40-12K4		12		K4	5046	13778	63	20	154	2	93	70	81.5	15	78	9	M8x1P	10	7
40-12K5				K5	6169	17404	63	25	178	2	93	70	81.5	15	78	9	M8x1P	10	7
40-12K6				K6	7260	21030	63	25	202	2	93	70	81.5	15	78	9	M8x1P	10	7
40-16K4		16		K4	5023	13729	63	20	184	2	93	70	81.5	15	78	9	M8x1P	10	7
40-16K5				K5	6141	17341	63	25	216	2	93	70	81.5	15	78	9	M8x1P	10	7
40-20K4		20		K4	4993	13666	63	25	220	2	93	70	81.5	15	78	9	M8x1P	10	7
40-20K5				K5	6104	17262	63	25	260	2	93	70	81.5	15	78	9	M8x1P	10	7
40-40K2		40		K2	2590	6568	63	45	208	2	93	70	81.5	15	78	9	M8x1P	10	7
45-6K6	45	6	3.969	K6	4173	16084	68	10	120	2	98	75	86.5	15	83	9	M8x1P	10	7
45-16K4		16	6.350	K4	5548	16818	70	20	190	2	105	80	92.5	18	88	11	M8x1P	10	9
45-16K5				K5	6783	21244	70	25	222	2	105	80	92.5	18	88	11	M8x1P	10	9
45-20K4		20		K4	5524	16762	70	25	220	2	105	80	92.5	18	88	11	M8x1P	10	9
45-20K5				K5	6753	21173	70	25	260	2	105	80	92.5	18	88	11	M8x1P	10	9
50-10K4	50	10	6.350	K4	5769	18450	75	16	144	2	110	85	97.5	18	93	11	M8x1P	10	9
50-10K6				K6	8299	28161	75	20	184	2	110	85	97.5	18	93	11	M8x1P	10	9
50-12K4		12		K4	5763	18435	75	25	166	2	110	85	97.5	18	93	11	M8x1P	10	9
50-12K6				K6	8290	28138	75	25	214	2	110	85	97.5	18	93	11	M8x1P	10	9
50-16K4		16		K4	5747	18396	75	20	196	2	110	85	97.5	18	93	11	M8x1P	10	9
50-16K6				K6	8267	28078	75	25	260	2	110	85	97.5	18	93	11	M8x1P	10	9
50-20K4		20		K4	5727	18346	75	25	228	2	110	85	97.5	18	93	11	M8x1P	10	9
50-20K6				K6	8238	28001	75	25	308	2	110	85	97.5	18	93	11	M8x1P	10	9
50-25K4		25		K4	5695	18268	75	30	262	2	110	85	97.5	18	93	11	M8x1P	10	9
50-25K6				K6	8193	27883	75	30	362	2	110	85	97.5	18	93	11	M8x1P	10	9
50-40K2		40		K2	3004	8840	75	45	222	2	110	85	97.5	18	93	11	M8x1P	10	9
50-40K3				K3	4392	13750	75	45	302	2	110	85	97.5	18	93	11	M8x1P	10	9
55-6K6	55	6	3.969	K6	4527	19779	102	10	124	2	144	102	128	18	122	11	M8x1P	10	9

9. Accuracy Standards

HIWIN is equipped with the latest hi-tech inspection equipment that fully meet all the requirements of DIN and JIS quality standards.

All ***HIWIN*** products pass a final inspection in accordance with to DIN or JIS standards.



HIWIN BALLSCREW INSPECTION CERTIFICATE

Inspected by Laser Measuring System of
JOHANN FISCHER ASCHAFFENBURG PRAZISIONSWERK, GERMANY

LEAD MEASURING
All measurement are made according to DIN STANDARD 69051
Under Condition: Humidity 40~60%, Temperature 20℃

Customer	Nominal diameter D O (mm) 25
Order No. S983855	Nominal pitch P=HO (mm) 4
Drawing No. A1065E-A1	Useful path Lu (mm) 488
Part No. 9838552008	Mean travel deviation e p (μm) ±16
Specification L25-482-FSW-528-600-0.008	Path compensation C (μm) -16

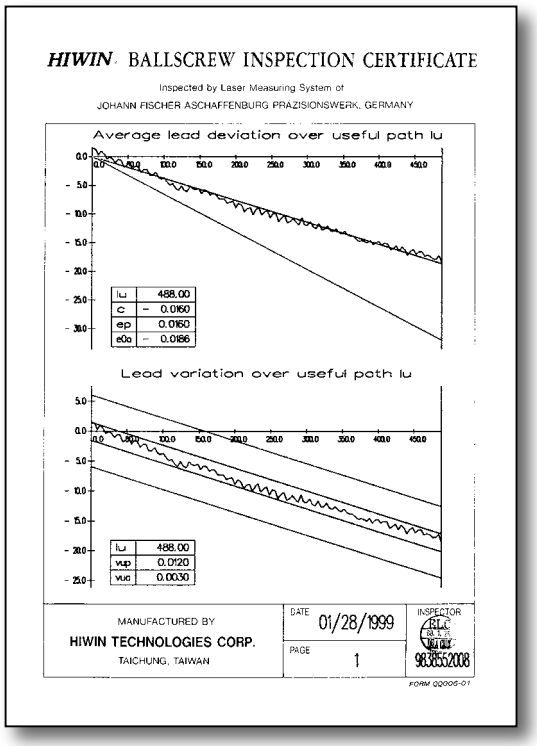
Average lead deviation over useful path Lu	e up= 0~-32 μm e ua= -18.6 μm	PERMISSIBLE ACCURACY GRADE	DIN	3
Lead variation over useful path Lu	v up= 12 μm v ua= 3.0 μm		HIWIN	3
Lead variation over path of 300mm	v 300p= 8 μm v 300a= 3.0 μm	MEASURED ACCURACY GRADE	DIN	1
Lead variation over 1 rotation	v 2πp= 6 μm v 2πa= 1.2 μm		HIWIN	0
Preload torque (without wipper)	(Tq)p=0.34-1.58 kgf-cm (Tq)a=0.62-1.55 kgf-cm			

MANUFACTURED BY
HIWIN TECHNOLOGIES CORP.
TAICHUNG, TAIWAN

DATE 02/10/1999
PAGE 1

INSPECTOR

FORM QQ004-02



HIWIN BALLSCREW INSPECTION CERTIFICATE

Inspected by Laser Measuring System of
JOHANN FISCHER ASCHAFFENBURG PRAZISIONSWERK, GERMANY

Average lead deviation over useful path lu

lu	488.00
c	- 0.0160
ep	0.0160
e0a	- 0.0186

Lead variation over useful path lu

lu	488.00
vup	0.0120
vua	0.0030

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TAICHUNG, TAIWAN

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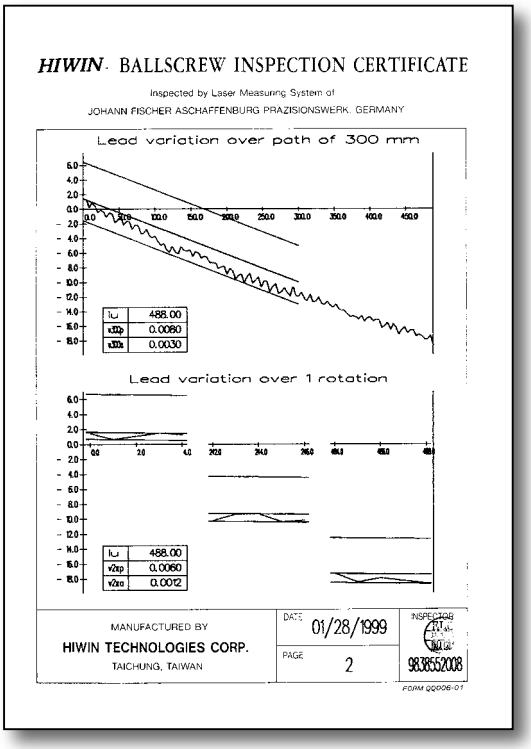
INSPECTOR

9838552008

FORM QQ005-01



HIWIN BALLSCREW INSPECTION CERTIFICATE

Inspected by Laser Measuring System of
JOHANN FISCHER ASCHAFFENBURG PRAZISIONSWERK, GERMANY

Lead variation over path of 300 mm

lu	488.00
v300p	0.0080
v300a	0.0030

Lead variation over 1 rotation

lu	488.00
v2πp	0.0060
v2πa	0.0012

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TAICHUNG, TAIWAN

DATE 01/28/1999
PAGE 2

INSPECTOR

9838552008

FORM QQ006-01

Every ***HIWIN*** precision ballscrew possesses an Inspection Certificate inspected by laser lead precision measurements that meet with DIN or JIS standards. Customers can be absolutely assured they will get a ballscrew with excellent lead accuracy.

10. HIWIN Ballscrew Request For Quote

Customer Name: _____ Date: _____

Address: _____ Phone: _____

_____ Country: _____

Desired Delivery Date: _____ Delivery Point: _____

Type of Ballscrew: (1) _____ Quantity: _____

(2) _____ Quantity: _____

Required Specifications:

(1) ☐ Single Start ☐ Double Start ☐ Four Start

(2) Direction of Turn: ☐ Right ☐ Left

(3) Shaft Diameter: _____

(4) Lead: _____

(5) Circuit: _____

(6) Nut Type: _____

(7) ☐ Internal ☐ External ☐ End Cap

(8) Thread Length: _____

(9) Overall Length: _____

(10) Accuracy Grade: _____

(Lead Deviation: _____ mm/300mm)

(11) Speed: rpm _____

(12) ☐ Rolled ☐ Ground

*Please refer to HIWIN catalog P.4 for nut information.

Special Requirements

●Please answer the following questions. Your answers will help to prepare a prompt quotation.

(a) In what kind of application will this ballscrew be used?

(b) Is this ballscrew used for the X, Y, or Z axis? Vertically or horizontally?

(c) How many ballscrews are needed for each machine and what is the annual requirement?

(d) If this is not a new project, which ballscrews are you currently using?