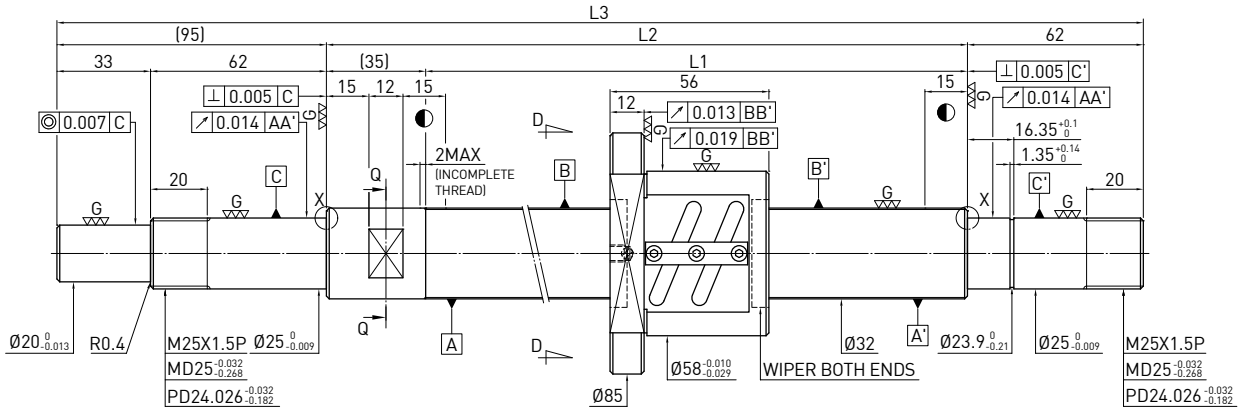
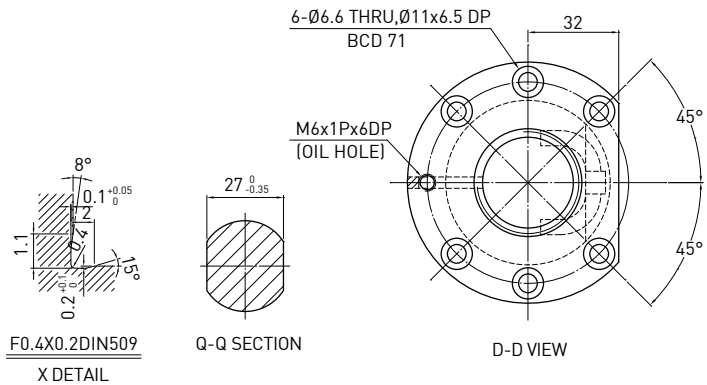


**F S W TYPE (SHAFT OD 32, LEAD 5)**

◀ Standard



Ballscrew Data	
Direction	Right Hand
Lead (mm)	5
Lead Angle	2.79°
P.C.D (mm)	32.6
Screw P.C.D (mm)	32.6
RD (mm)	29.324
Steel Ball (mm)	Ø3.175
Circuits	2.5x2
Dynamic Load C (Kgf)	1188
Static Load Co (Kgf)	2833
Axial Play (mm)	0
Drag Torque (Kgf-cm)	0.48-1.92
Spacer Ball	1 : 1

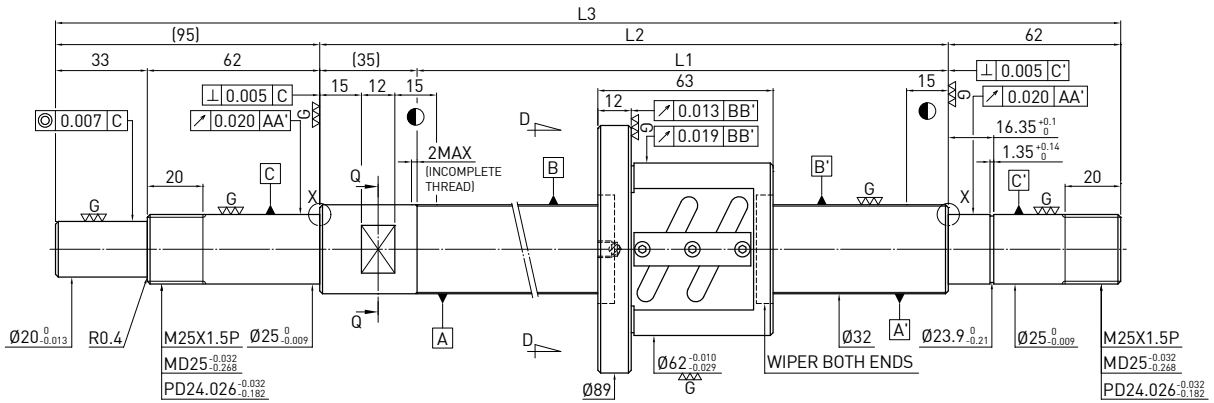


Unit : mm

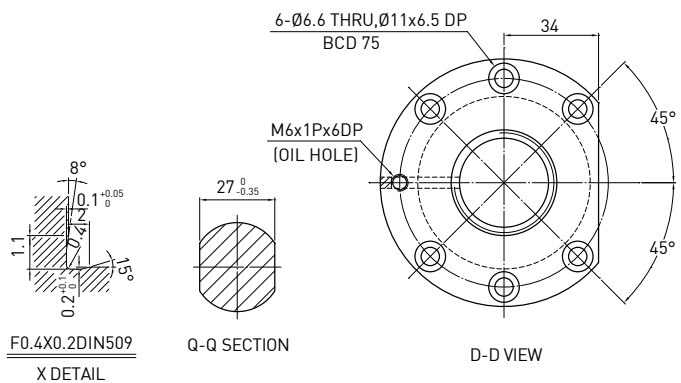
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	R32-5B2-FSW-265-457-0.018	265	300	457	5
250	R32-5B2-FSW-365-557-0.018	365	400	557	5
350	R32-5B2-FSW-465-657-0.018	465	500	657	5
450	R32-5B2-FSW-565-757-0.018	565	600	757	5
550	R32-5B2-FSW-665-857-0.018	665	700	857	5
650	R32-5B2-FSW-765-957-0.018	765	800	957	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

**F S W** TYPE (SHAFT OD 32, LEAD 6)

◀ Standard



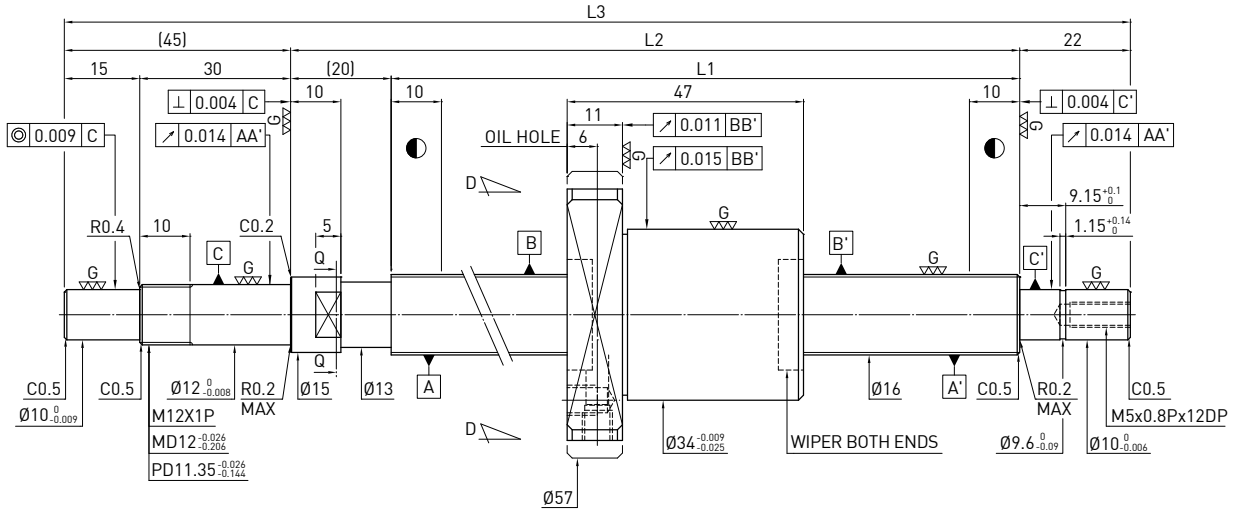
Ball screw Data	
Direction	Right Hand
Lead (mm)	6
Lead Angle	3.33°
P.C.D (mm)	32.8
Screw P.C.D (mm)	32.8
RD (mm)	28.744
Steel Ball (mm)	Ø3.969
Circuits	2.5x2
Dynamic Load C (Kgf)	1610
Static Load Co (Kgf)	3510
Axial Play (mm)	0
Drag Torque (Kgf-cm)	0.48-2.72
Spacer Ball	1 : 1



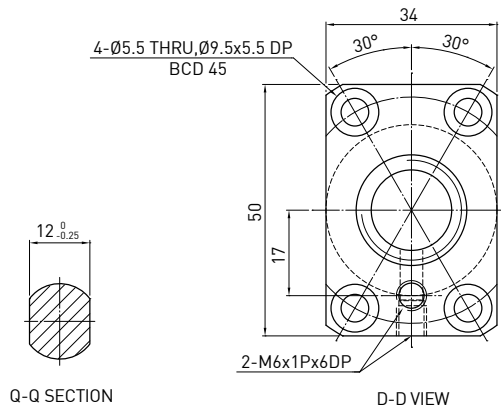
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R32-6B2-FSW-365-557-0.018	365	400	557	5
450	R32-6B2-FSW-565-757-0.018	565	600	757	5
650	R32-6B2-FSW-765-957-0.018	765	800	957	5
850	R32-6B2-FSW-965-1157-0.018	965	1000	1157	5
1050	R32-6B2-FSW-1165-1357-0.018	1165	1200	1357	5
1350	R32-6B2-FSW-1465-1657-0.018	1465	1500	1657	5

**F S C TYPE (SHAFT OD 16, LEAD 16)** ◀ Standard



Ballscrew Data	
Direction	Right Hand
Lead (mm)	16
Lead Angle	17.06°
P.C.D (mm)	16.6
Screw P.C.D (mm)	16.6
RD (mm)	13.324
Steel Ball (mm)	Ø3.175
Circuits	2
Dynamic Load C (Kgf)	420      680
Static Load Co (Kgf)	690      1385
Axial Play (mm)	0      0.005 MAX
Drag Torque (Kgf-cm)	0.15-0.79      0.24 MAX
Spacer Ball	1 : 1      -

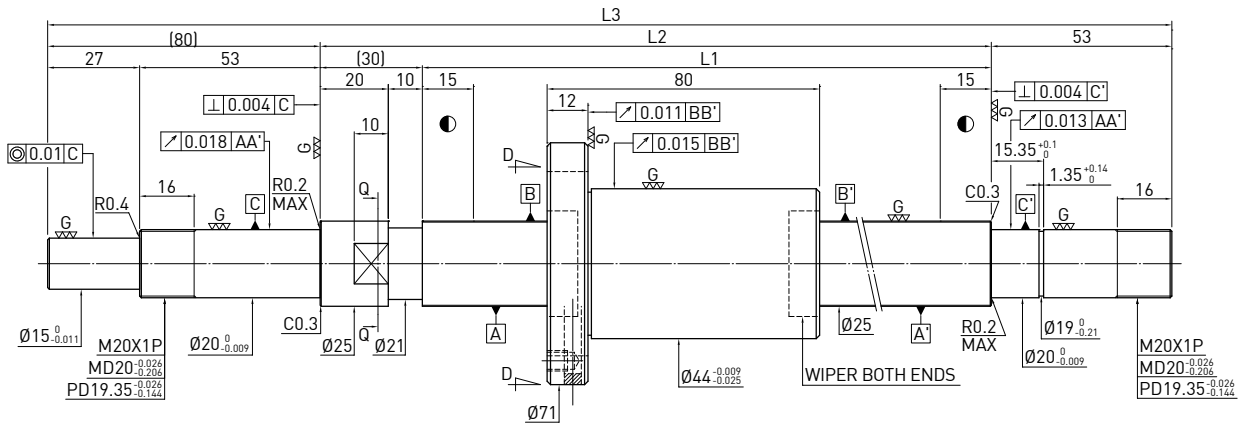


Unit : mm

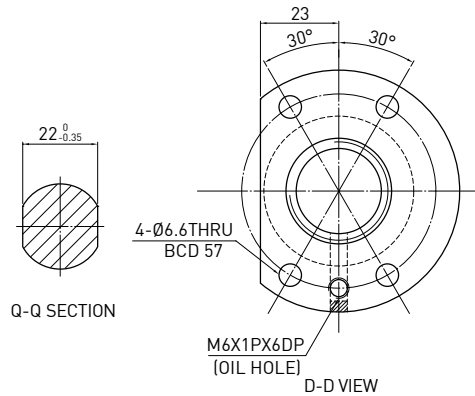
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
100	R16-16K2-FSC-184- 271-0.018	184	204	271	5
150	R16-16K2-FSC-234- 321-0.018	234	254	321	5
200	R16-16K2-FSC-284- 371-0.018	284	304	371	5
250	R16-16K2-FSC-334- 421-0.018	334	354	421	5
300	R16-16K2-FSC-384- 471-0.018	384	404	471	5
350	R16-16K2-FSC-434- 521-0.018	434	454	521	5
400	R16-16K2-FSC-484- 571-0.018	484	504	571	5
450	R16-16K2-FSC-534- 621-0.018	534	554	621	5
500	R16-16K2-FSC-584- 671-0.018	584	604	671	5
550	R16-16K2-FSC-634- 721-0.018	634	654	721	5
600	R16-16K2-FSC- 684-771-0.018	684	704	771	5
700	R16-16K2-FSC- 784-871-0.018	784	804	871	5
800	R16-16K2-FSC- 884-971-0.018	884	904	971	5
1000	R16-16K2-FSC- 1084-1171-0.018	1084	1104	1171	5

**F S C TYPE (SHAFT OD 25, LEAD 20)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	20
Lead Angle	13.97°
P.C.D (mm)	25.6
Screw P.C.D (mm)	25.6
RD (mm)	22.324
Steel Ball (mm)	Ø3.175
Circuits	3
Dynamic Load C (Kgf)	790      1260
Static Load Co (Kgf)	1715      3430
Axial Play (mm)	0      0.005 MAX
Drag Torque (Kgf-cm)	0.4-2.5      0.5 MAX
Spacer Ball	1 : 1      -

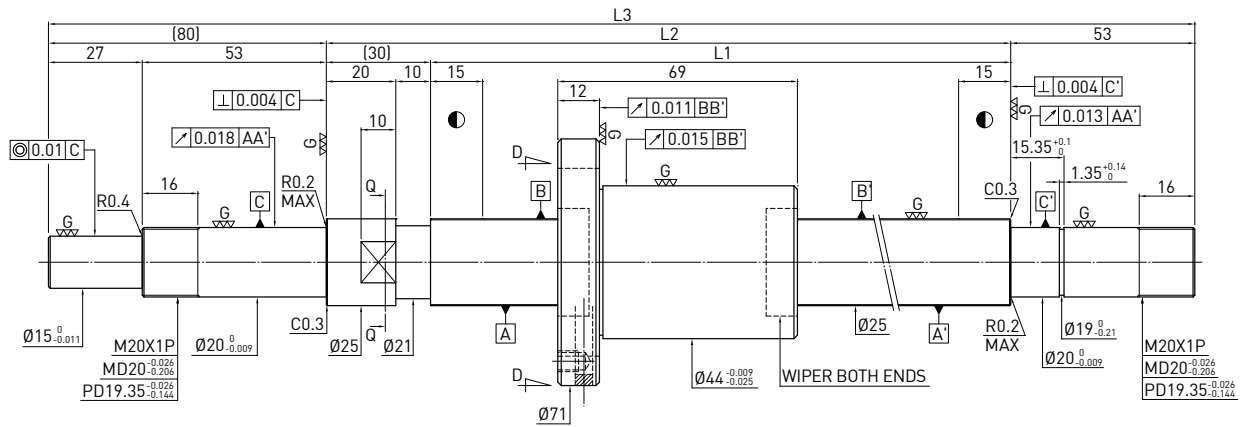


Unit : mm

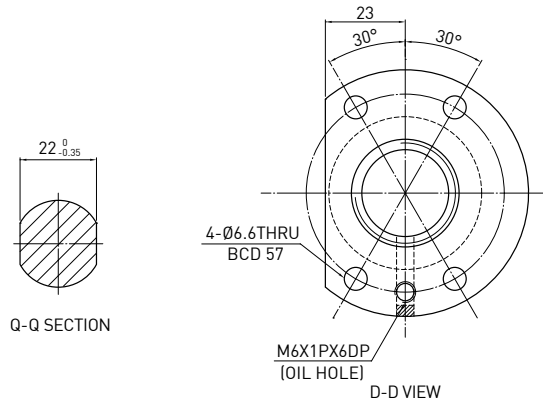
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
600	R25-20K3-FSC- 750- 913-0.018	750	780	913	5
800	R25-20K3-FSC- 950- 1113-0.018	950	980	1113	5
1000	R25-20K3-FSC- 1150- 1313-0.018	1150	1180	1313	5
1200	R25-20K3-FSC- 1350- 1513-0.018	1350	1380	1513	5
1400	R25-20K3-FSC- 1550- 1713-0.018	1550	1580	1713	5
1600	R25-20K3-FSC- 1750- 1913-0.018	1750	1780	1913	5
2000	R25-20K3-FSC- 2150- 2313-0.018	2150	2180	2313	5

**F S C TYPE (SHAFT OD 25, LEAD 25)**

◀ Standard



Ball screw Data		
Direction	Right Hand	
Lead (mm)	25	
Lead Angle	17.27°	
P.C.D (mm)	25.6	
Screw P.C.D (mm)	25.6	
RD (mm)	22.324	
Steel Ball (mm)	Ø3.175	
Circuits	2	
Dynamic Load C (Kgf)	520	840
Static Load Co (Kgf)	1085	2170
Axial Play (mm)	0	0.005 MAX
Drag Torque (Kgf-cm)	0.4~2.5	0.25 MAX
Spacer Ball	1 : 1	-

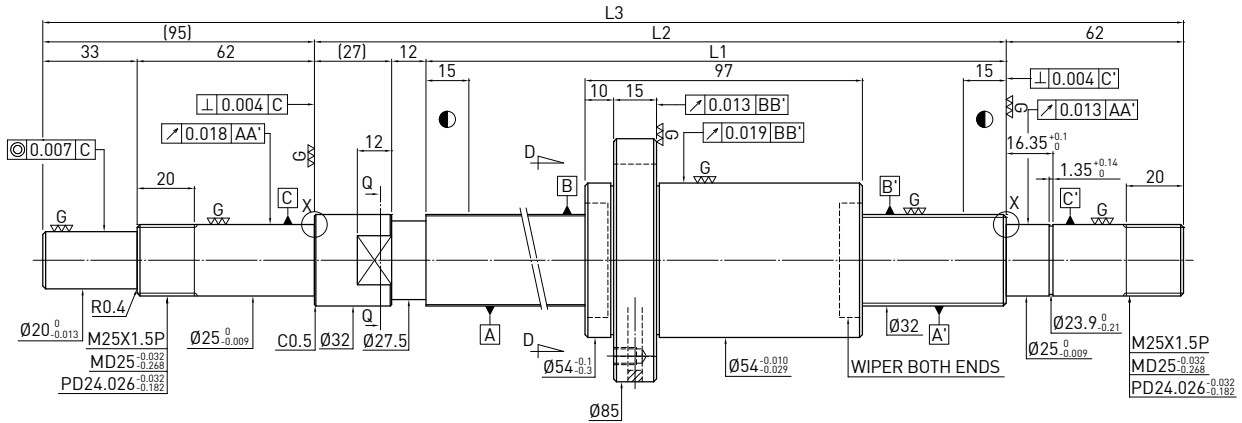


Unit : mm

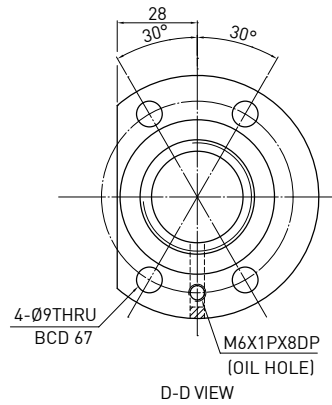
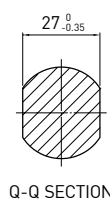
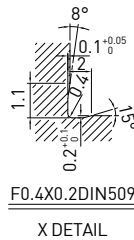
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
600	R25-25K2-FSC-750-913-0.018	750	780	913	5
800	R25-25K2-FSC-950-1113-0.018	950	980	1113	5
1000	R25-25K2-FSC-1150-1313-0.018	1150	1180	1313	5
1200	R25-25K2-FSC-1350-1513-0.018	1350	1380	1513	5
1400	R25-25K2-FSC-1550-1713-0.018	1550	1580	1713	5
1600	R25-25K2-FSC-1750-1913-0.018	1750	1780	1913	5
2000	R25-25K2-FSC-2150-2313-0.018	2150	2180	2313	5

**F S C TYPE (SHAFT OD 32, LEAD 25)**

◀ Standard



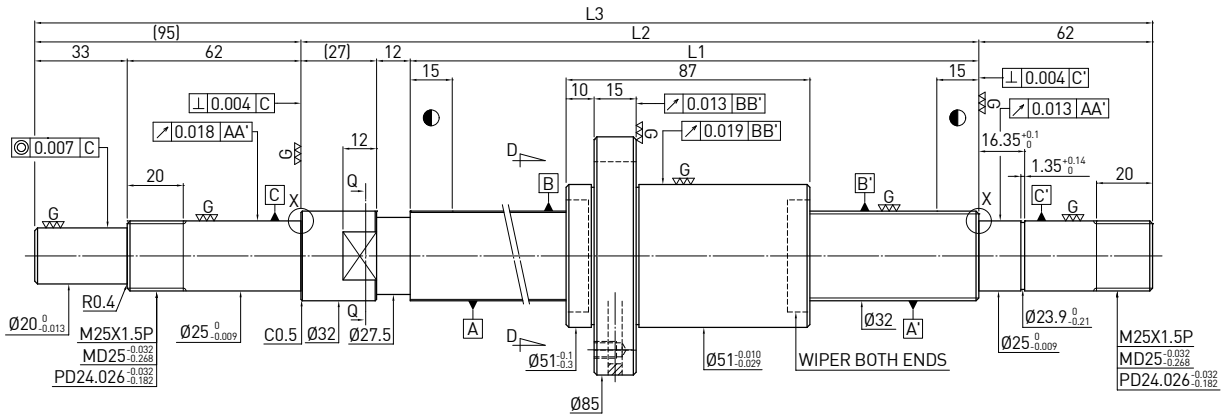
Ball screw Data		
Direction	Right Hand	
Lead (mm)	25	
Lead Angle	13.56°	
P.C.D (mm)	33	
Screw P.C.D (mm)	33	
RD (mm)	28.132	
Steel Ball (mm)	Ø4.763	
Circuits	3	
Dynamic Load C (Kgf)	1980	3150
Static Load Co (Kgf)	4410	8820
Axial Play (mm)	0	0.005 or less
Drag Torque (Kgf-cm)	0.69-3.21	0.8MAX
Spacer Ball	1 : 1	-



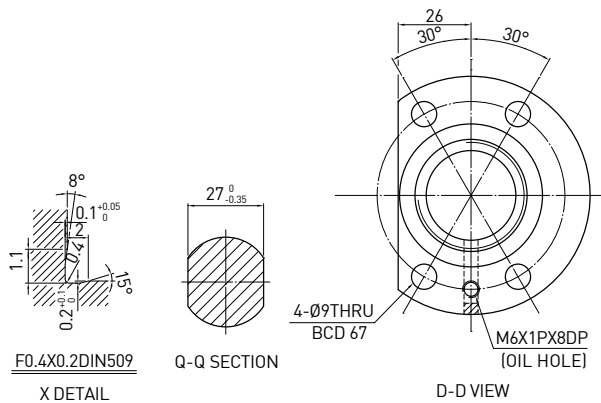
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
1000	R32-25K3-FSC-1180-1376-0.018	1180	1219	1376	5
1500	R32-25K3-FSC-1680-1876-0.018	1680	1719	1876	5
2000	R32-25K3-FSC-2180-2376-0.018	2180	2219	2376	5
2600	R32-25K3-FSC-2780-2976-0.018	2780	2819	2976	5

**F S C** TYPE (SHAFT OD 32, LEAD 32) Standard



Ballscrew Data		
Direction	Right Hand	
Lead (mm)	32	
Lead Angle	17.25°	
P.C.D (mm)	32.8	
Screw P.C.D (mm)	32.8	
RD (mm)	28.744	
Steel Ball (mm)	Ø3.969	
Circuits	2	
Dynamic Load C (Kgf)	800	1280
Static Load Co (Kgf)	1765	3530
Axial Play (mm)	0	0.005 or less
Drag Torque (Kgf-cm)	0.7-3.21	0.8MAX
Spacer Ball	1 : 1	-

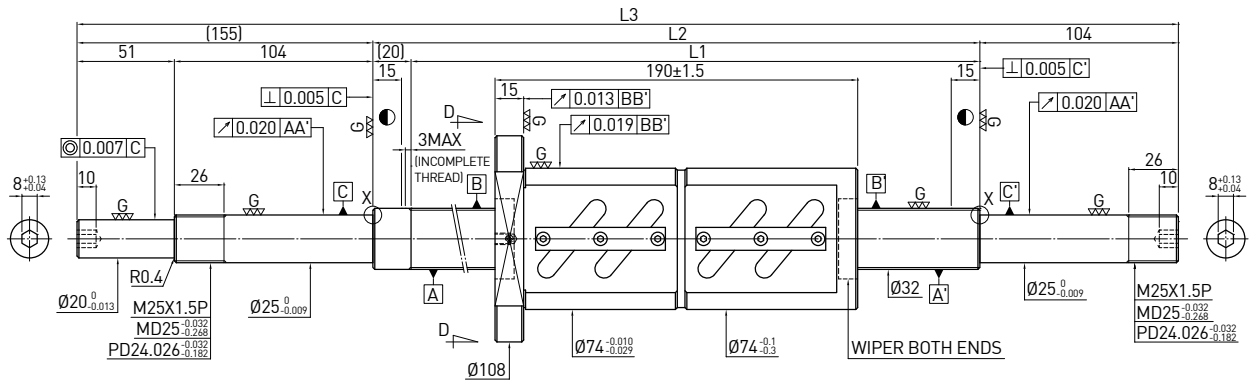


Unit : mm

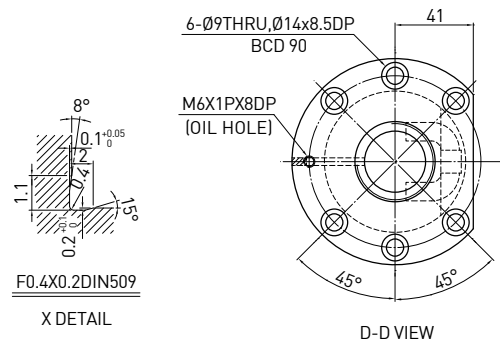
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
1000	R32-32K2-FSC-1180-1376-0.018	1180	1219	1376	5
1500	R32-32K2-FSC-1680-1876-0.018	1680	1719	1876	5
2000	R32-32K2-FSC-2180-2376-0.018	2180	2219	2376	5
2600	R32-32K2-FSC-2780-2976-0.018	2780	2819	2976	5

**F D W TYPE (SHAFT OD 32, LEAD 10)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	5.44°
P.C.D (mm)	33.4
Screw P.C.D (mm)	33.4
RD (mm)	26.91
Steel Ball (mm)	Ø6.35
Circuits	2.5x2
Dynamic Load C (Kgf)	4810
Static Load Co (Kgf)	11199
Axial Play (mm)	0
Drag Torque (Kgf-cm)	5.51~11.43
Spacer Ball	-



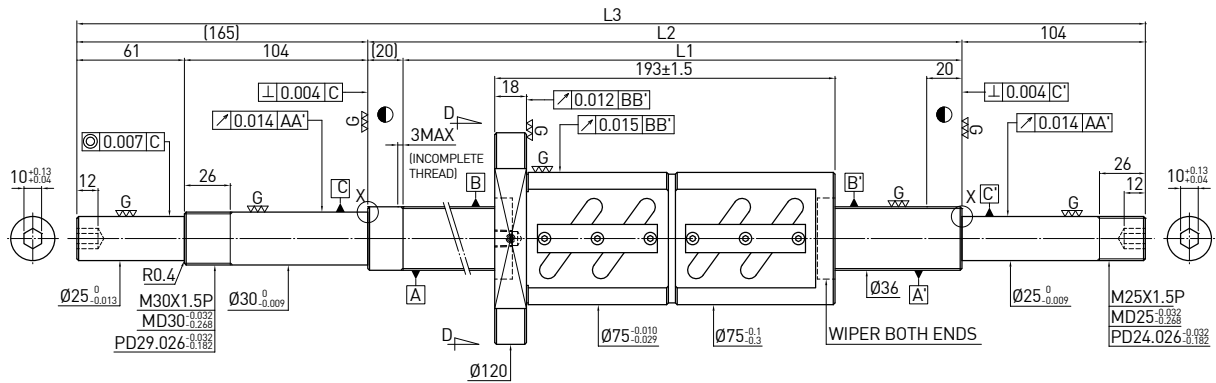
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	R32-10B2-FDW-380-659-0.018	380	400	659	5
250	R32-10B2-FDW-480-759-0.018	480	500	759	5
350	R32-10B2-FDW-580-859-0.018	580	600	859	5
450	R32-10B2-FDW-680-959-0.018	680	700	959	5
550	R32-10B2-FDW-780-1059-0.018	780	800	1059	5
750	R32-10B2-FDW-980-1259-0.018	980	1000	1259	5
950	R32-10B2-FDW-1180-1459-0.018	1180	1200	1459	5
1250	R32-10B2-FDW-1480-1759-0.018	1480	1500	1759	5
1550	R32-10B2-FDW-1780-2059-0.018	1780	1800	2059	5

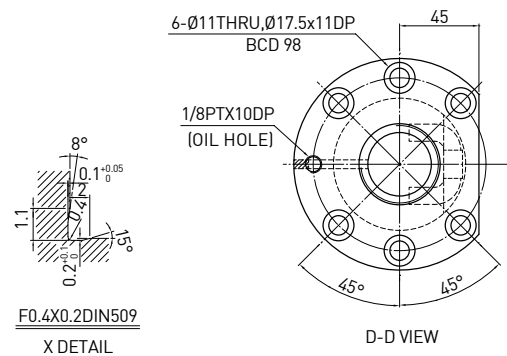


**F D W TYPE (SHAFT OD 36, LEAD 10)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	4.86°
P.C.D (mm)	37.4
Screw P.C.D (mm)	37.4
RD (mm)	30.91
Steel Ball (mm)	$\varnothing 6.35$
Circuits	2.5x2
Dynamic Load C (Kgf)	5105
Static Load Co (Kgf)	12668
Axial Play (mm)	0
Drag Torque (Kgf-cm)	6.64~12.34
Spacer Ball	-

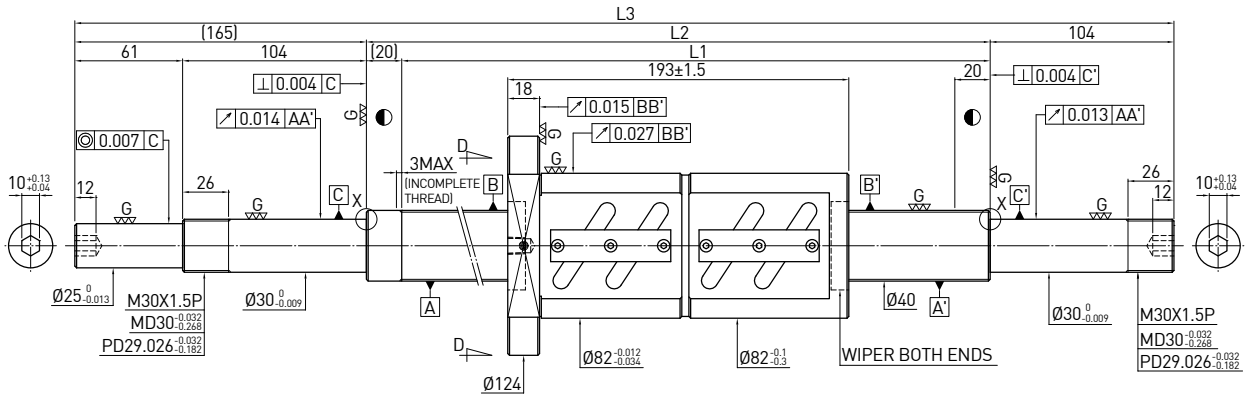


Unit : mm

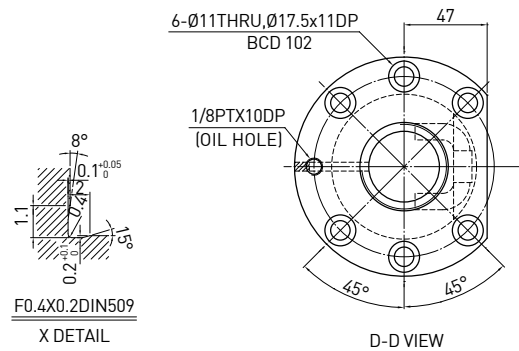
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R36-10B2-FDW-480-769-0.018	480	500	769	5
450	R36-10B2-FDW-680-969-0.018	680	700	969	5
750	R36-10B2-FDW-980-1269-0.018	980	1000	1269	5
1150	R36-10B2-FDW-1380-1669-0.018	1380	1400	1669	5
1550	R36-10B2-FDW-1780-2069-0.018	1780	1800	2069	5

**F D W TYPE (SHAFT OD 40, LEAD 10)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	4.4°
P.C.D (mm)	41.4
Screw P.C.D (mm)	41.4
RD (mm)	34.91
Steel Ball (mm)	Ø6.35
Circuits	2.5x2
Dynamic Load C (Kgf)	5369
Static Load Co (Kgf)	14138
Axial Play (mm)	0
Drag Torque (Kgf-cm)	8.26-13.78
Spacer Ball	-

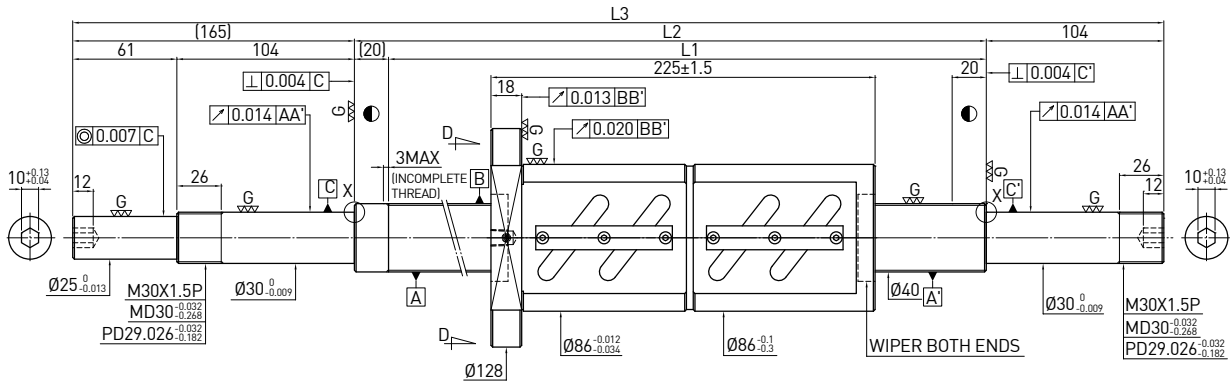


Unit : mm

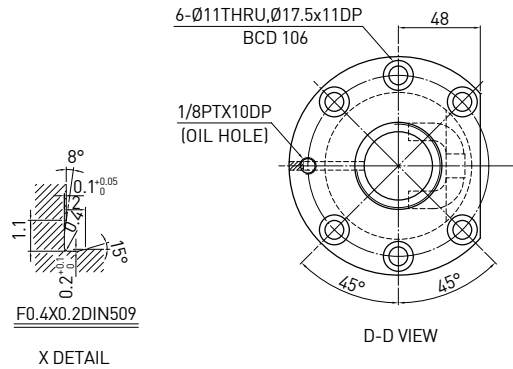
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R40-10B2-FDW-480-769-0.018	480	500	769	5
350	R40-10B2-FDW-580-869-0.018	580	600	869	5
450	R40-10B2-FDW-680-969-0.018	680	700	969	5
550	R40-10B2-FDW-780-1069-0.018	780	800	1069	5
750	R40-10B2-FDW-980-1269-0.018	980	1000	1269	5
950	R40-10B2-FDW-1180-1469-0.018	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

**F D W TYPE (SHAFT OD 40, LEAD 12)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	12
Lead Angle	5.25°
P.C.D (mm)	41.6
Screw P.C.D (mm)	41.6
RD (mm)	34.299
Steel Ball (mm)	Ø7.144
Circuits	2.5x2
Dynamic Load C [Kgf]	6216
Static Load Co [Kgf]	15614
Axial Play (mm)	0
Drag Torque (Kgf-cm)	9.79-18.17
Spacer Ball	-

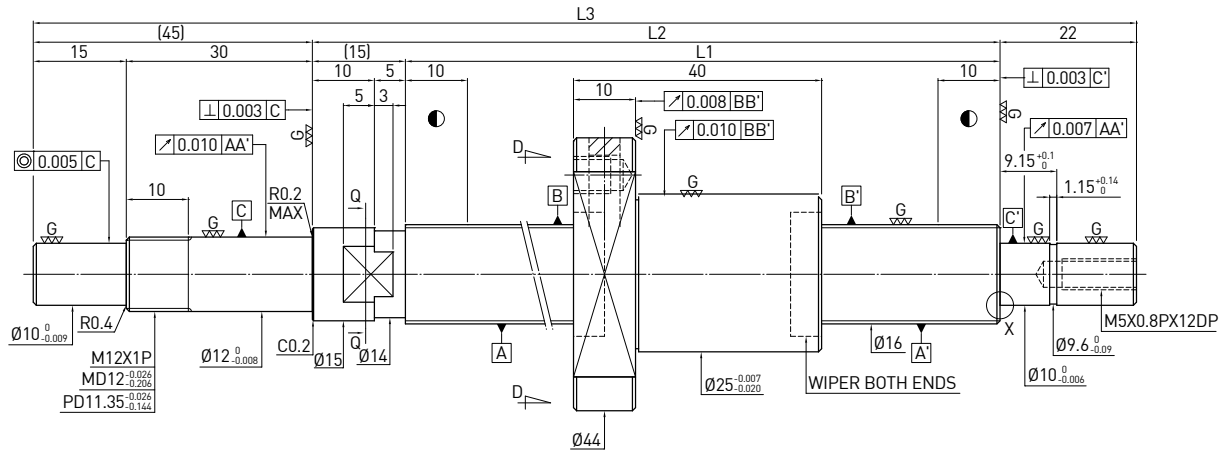


Unit : mm

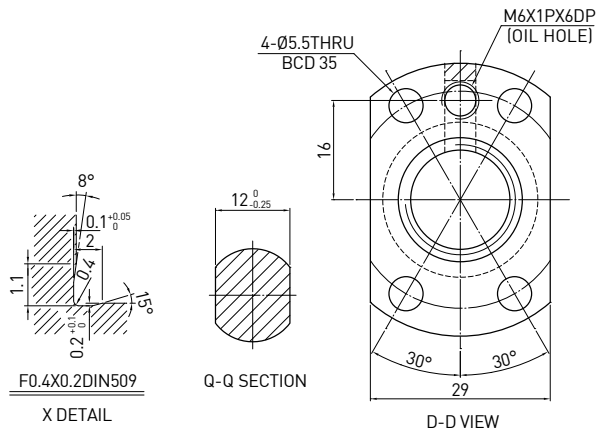
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
400	R40-12B2-FDW-680-969-0.018	680	700	969	5
700	R40-12B2-FDW-980-1269-0.018	980	1000	1269	5
1100	R40-12B2-FDW-1380-1669-0.018	1380	1400	1669	5
1500	R40-12B2-FDW-1780-2069-0.018	1780	1800	2069	5
2200	R40-12B2-FDW-2480-2769-0.018	2480	2500	2769	5

**F S I** TYPE (SHAFT OD 16, LEAD 2)

◀ Standard



Ballscrew Data	
Direction	Right Hand
Lead (mm)	2
Lead Angle	2.25°
P.C.D (mm)	16.2
Screw P.C.D (mm)	16.2
RD (mm)	14.652
Steel Ball (mm)	Ø1.5
Circuits	1x4
Dynamic Load C (Kgf)	323
Static Load Co (Kgf)	790
Axial Play (mm)	0      0.005 or less
Drag Torque (Kgf-cm)	0.05~0.5      0.15MAX
Spacer Ball	-      -

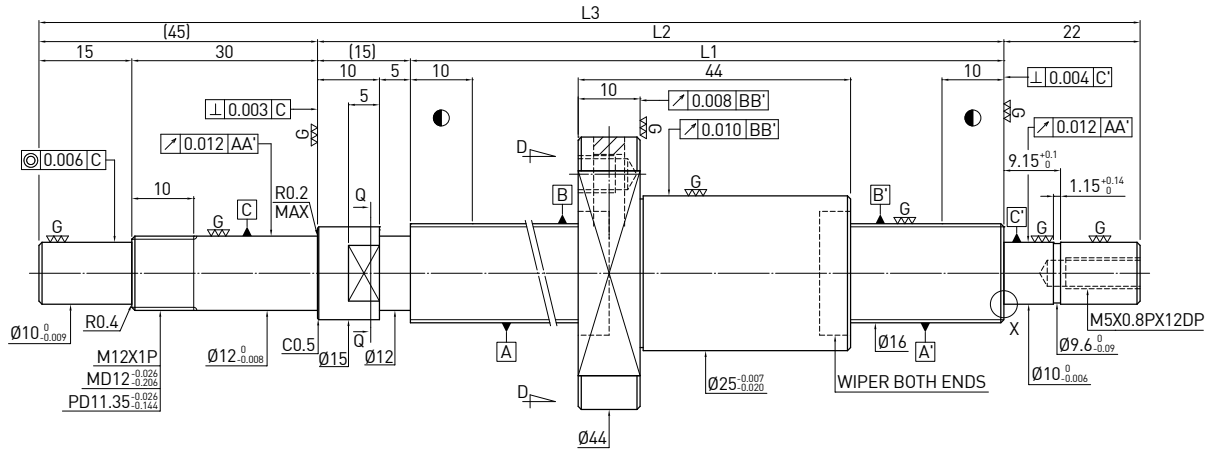


Unit : mm

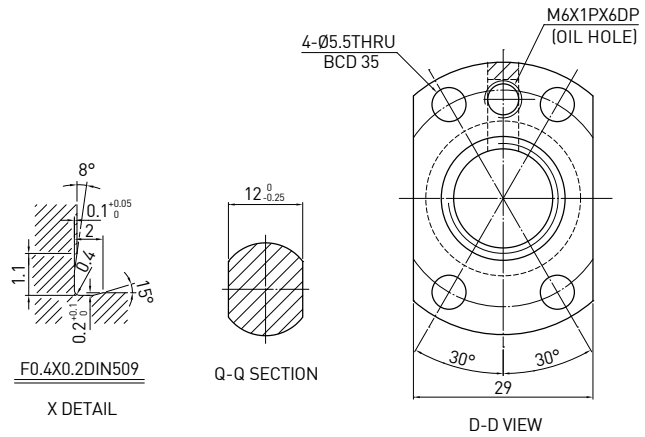
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
50	R16-2T4-FSI-139-221-0.008	139	154	221	3
100	R16-2T4-FSI-189-271-0.008	189	204	271	3
150	R16-2T4-FSI-239-321-0.008	239	254	321	3
200	R16-2T4-FSI-289-371-0.008	289	304	371	3
300	R16-2T4-FSI-389-471-0.008	389	404	471	3

**F S I** TYPE (SHAFT OD 16, LEAD 2.5)

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	2.5
Lead Angle	2.81°
P.C.D (mm)	16.2
Screw P.C.D (mm)	16.2
RD (mm)	14.652
Steel Ball (mm)	Ø1.5
Circuits	1x4
Dynamic Load C (Kgf)	323
Static Load Co (Kgf)	790
Axial Play (mm)	0      0.005 or less
Drag Torque (Kgf-cm)	0.05~0.5      0.15MAX
Spacer Ball	-      -

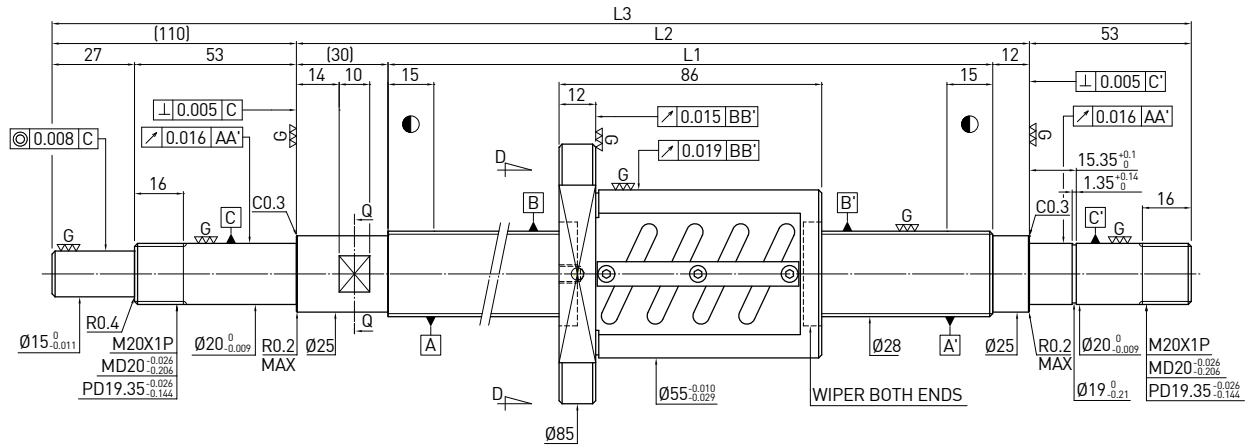


Unit : mm

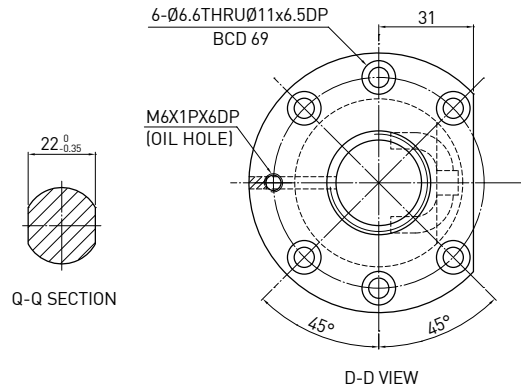
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
50	R16-2.5T4-FSI-139-221-0.008	139	154	221	3
100	R16-2.5T4-FSI-189-271-0.008	189	204	271	3
150	R16-2.5T4-FSI-239-321-0.008	239	254	321	3
200	R16-2.5T4-FSI-289-371-0.008	289	304	371	3
300	R16-2.5T4-FSI-389-471-0.008	389	404	471	3

**O F S W** TYPE (SHAFT OD 16, LEAD 2)

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	5
Lead Angle	3.19°
P.C.D (mm)	28.6
Screw P.C.D (mm)	28.6
RD (mm)	25.324
Steel Ball (mm)	$\varnothing 3.175$
Circuits	2.5x2
Dynamic Load C (Kgf)	1784
Static Load Co (Kgf)	4932
Axial Play (mm)	0
Drag Torque (Kgf-cm)	1.1-3.3
Spacer Ball	-

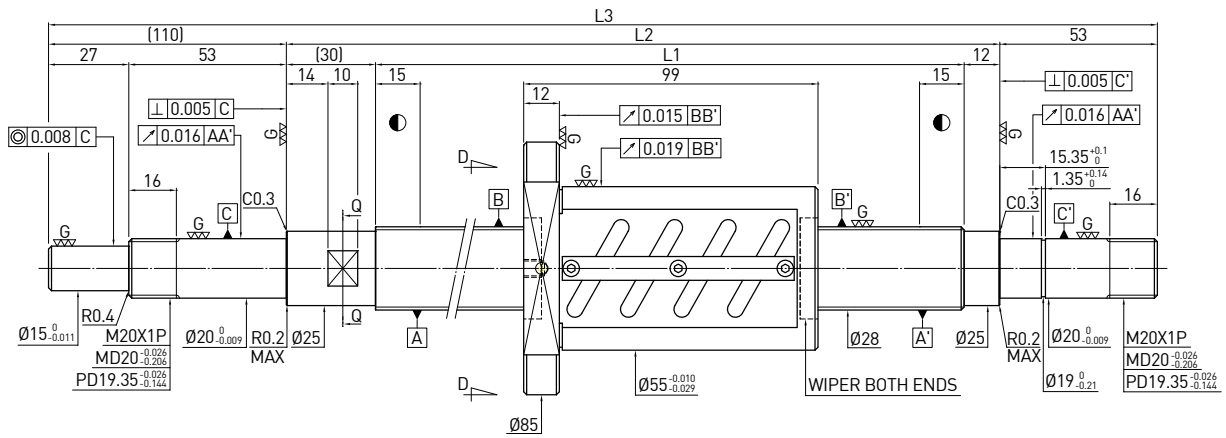


Unit : mm

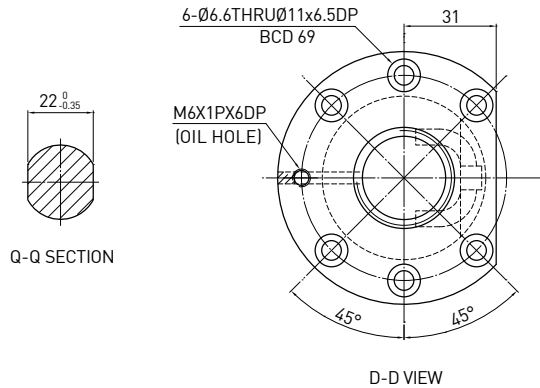
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	R28-5B2-0FSW-270-445-0.018	270	312	445	5
250	R28-5B2-0FSW-370-545-0.018	370	412	545	5
350	R28-5B2-0FSW-470-645-0.018	470	512	645	5
450	R28-5B2-0FSW-558-733-0.018	558	600	733	5
650	R28-5B2-0FSW-758-933-0.018	758	800	933	5
850	R28-5B2-0FSW-958-1133-0.018	958	1000	1133	5
1050	R28-5B2-0FSW-1158-1333-0.018	1158	1200	1333	5

**O F S W** TYPE (SHAFT OD 28, LEAD 6)

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	6
Lead Angle	$3.82^\circ$
P.C.D (mm)	28.6
Screw P.C.D (mm)	28.6
RD (mm)	25.324
Steel Ball (mm)	$\varnothing 3.175$
Circuits	2.5x2
Dynamic Load C (Kgf)	1784
Static Load Co (Kgf)	4932
Axial Play (mm)	0
Drag Torque (Kgf-cm)	1.2-3.6
Spacer Ball	-

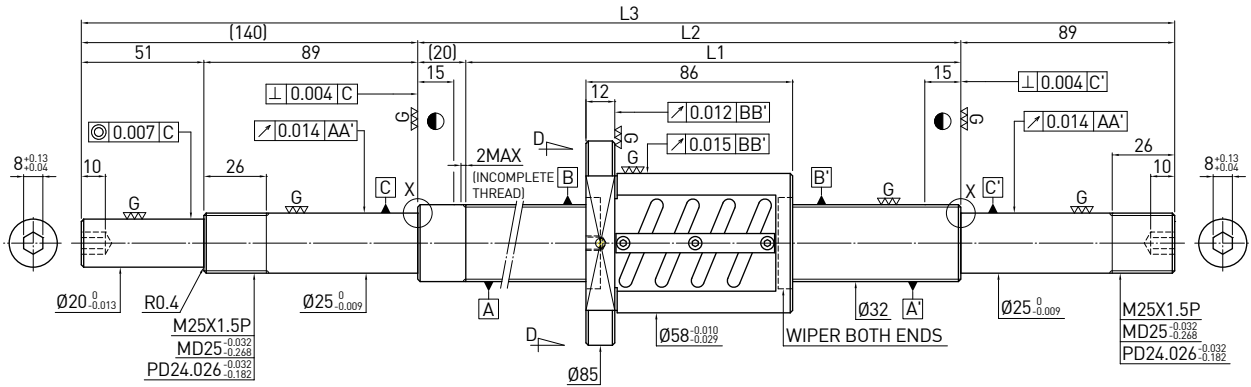


Unit : mm

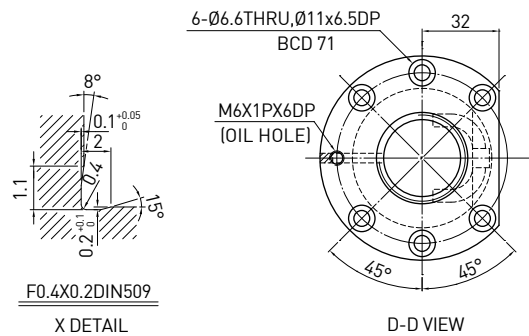
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R28-6B2-OFSW-370-545-0.018	370	412	545	5
450	R28-6B2-OFSW-570-745-0.018	570	612	745	5
650	R28-6B2-OFSW-758-933-0.018	758	800	933	5
850	R28-6B2-OFSW-958-1133-0.018	958	1000	1133	5
1050	R28-6B2-OFSW-1158-1333-0.018	1158	1200	1333	5

**O F S W** TYPE (SHAFT OD 32, LEAD 5)

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	5
Lead Angle	2.79°
P.C.D (mm)	32.6
Screw P.C.D (mm)	32.6
RD (mm)	29.324
Steel Ball (mm)	Ø3.175
Circuits	2.5x2
Dynamic Load C (Kgf)	1886
Static Load Co (Kgf)	5666
Axial Play (mm)	0
Drag Torque (Kgf-cm)	1.2-3.6
Spacer Ball	-



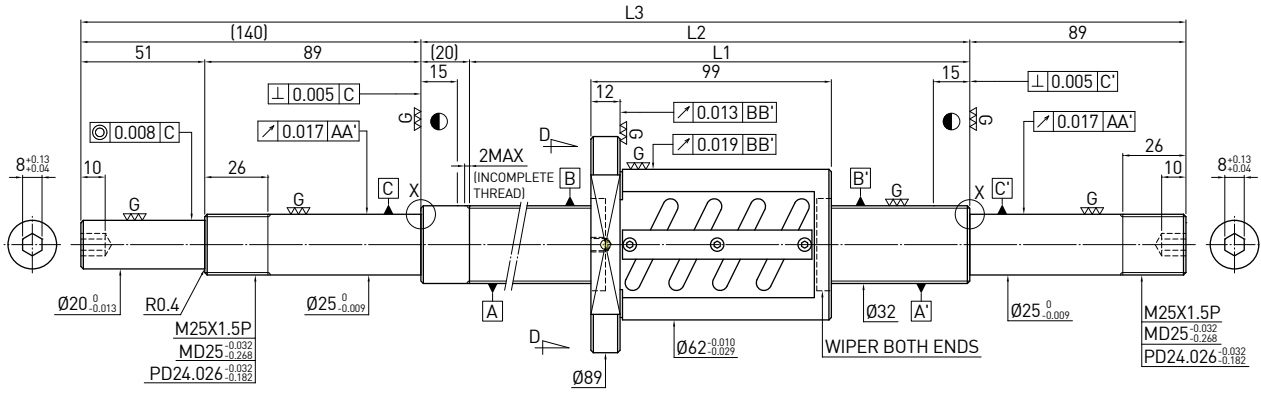
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	R32-5B2-OFSW-280-529-0.018	280	300	529	5
250	R32-5B2-OFSW-380-629-0.018	380	400	629	5
350	R32-5B2-OFSW-480-729-0.018	480	500	729	5
450	R32-5B2-OFSW-580-829-0.018	580	600	829	5
550	R32-5B2-OFSW-680-929-0.018	680	700	929	5
650	R32-5B2-OFSW-780-1029-0.018	780	800	1029	5
850	R32-5B2-OFSW-980-1229-0.018	980	1000	1229	5
1050	R32-5B2-OFSW-1180-1429-0.018	1180	1200	1429	5
1350	R32-5B2-OFSW-1480-1729-0.018	1480	1500	1729	5

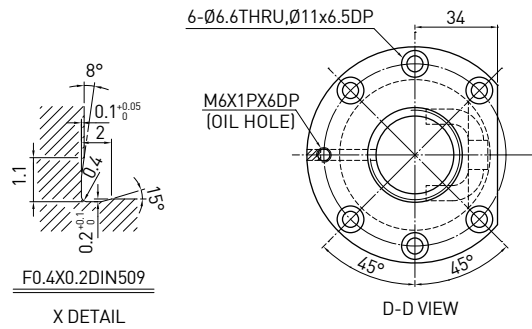


**OFSW** TYPE (SHAFT OD 32, LEAD 6)

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	6
Lead Angle	3.33°
P.C.D (mm)	32.8
Screw P.C.D (mm)	32.8
RD (mm)	28.744
Steel Ball (mm)	Ø3.969
Circuits	2.5x2
Dynamic Load C (Kgf)	2556
Static Load Co (Kgf)	7019
Axial Play (mm)	0
Drag Torque (Kgf-cm)	2.32-4.82
Spacer Ball	-

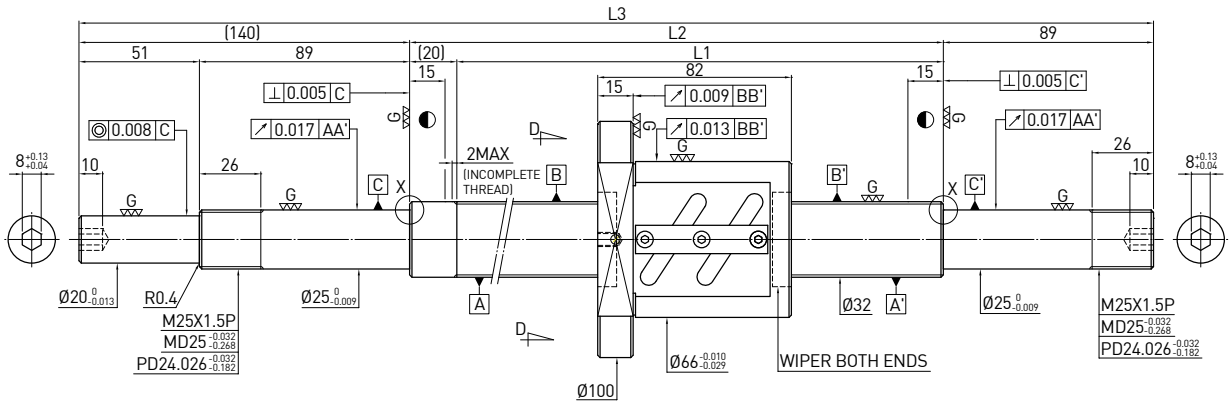


Unit : mm

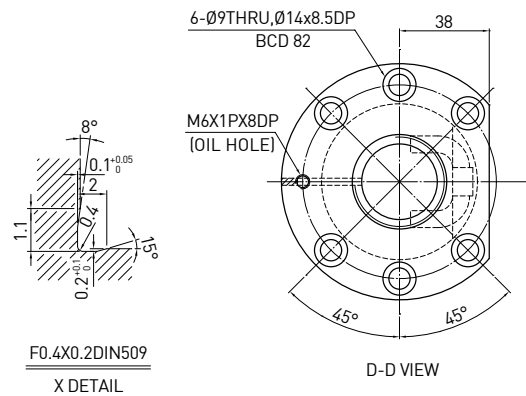
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R32-6B2-OFSW-380-629-0.018	380	400	629	5
450	R32-6B2-OFSW-580-829-0.018	580	600	829	5
650	R32-6B2-OFSW-780-1029-0.018	780	800	1029	5
850	R32-6B2-OFSW-980-1229-0.018	980	1000	1229	5
1050	R32-6B2-OFSW-1180-1429-0.018	1180	1200	1429	5
1350	R32-6B2-OFSW-1480-1729-0.018	1480	1500	1729	5

**O F S W** TYPE (SHAFT OD 32, LEAD 8)

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	8
Lead Angle	4.41°
P.C.D (mm)	33
Screw P.C.D (mm)	33
RD (mm)	28.132
Steel Ball (mm)	Ø4.763
Circuits	2.5x1
Dynamic Load C (Kgf)	2650
Static Load Co (Kgf)	5599
Axial Play (mm)	0
Drag Torque (Kgf-cm)	1.26-5.06
Spacer Ball	-

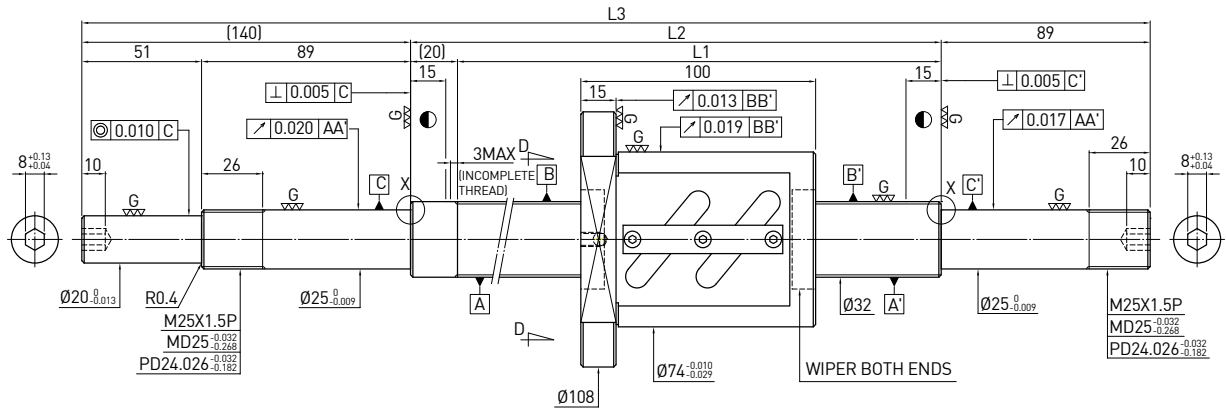


Unit : mm

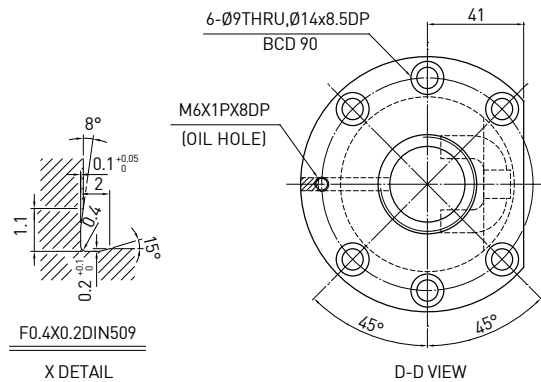
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R32-8B1-OFSW-380-629-0.018	380	400	629	5
450	R32-8B1-OFSW-580-829-0.018	580	600	829	5
650	R32-8B1-OFSW-780-1029-0.018	780	800	1029	5
850	R32-8B1-OFSW-980-1229-0.018	980	1000	1229	5
1350	R32-8B1-OFSW-1480-1729-0.018	1480	1500	1729	5

**O F S W TYPE (SHAFT OD 32, LEAD 10)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	5.44°
P.C.D (mm)	33.4
Screw P.C.D (mm)	33.4
RD (mm)	26.91
Steel Ball (mm)	Ø6.35
Circuits	2.5x1
Dynamic Load C (Kgf)	2650
Static Load Co (Kgf)	5599
Axial Play (mm)	0
Drag Torque (Kgf-cm)	3.58-7.44
Spacer Ball	-



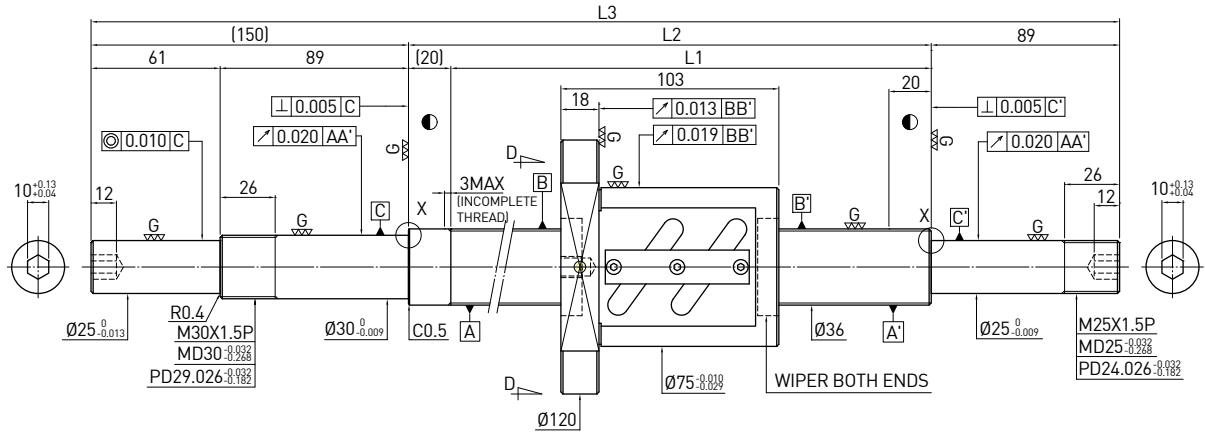
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R32-10B1-OFSW-380-629-0.018	380	400	629	5
350	R32-10B1-OFSW-480-729-0.018	480	500	729	5
450	R32-10B1-OFSW-580-829-0.018	580	600	829	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

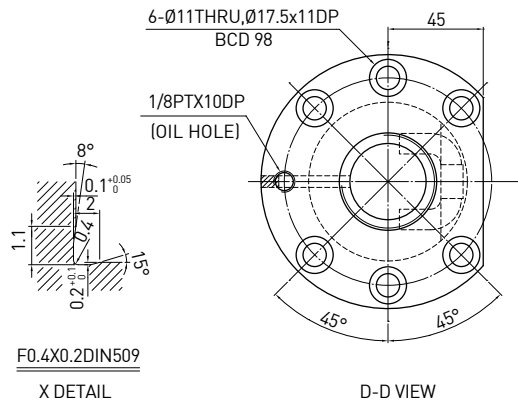


**TYPE (SHAFT OD 36, LEAD 10)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	4.84°
P.C.D (mm)	37.4
Screw P.C.D (mm)	37.4
RD (mm)	30.91
Steel Ball (mm)	Ø6.35
Circuits	2.5x1
Dynamic Load C (Kgf)	2812
Static Load Co (Kgf)	6334
Axial Play (mm)	0
Drag Torque (Kgf-cm)	3.91-8.13
Spacer Ball	-

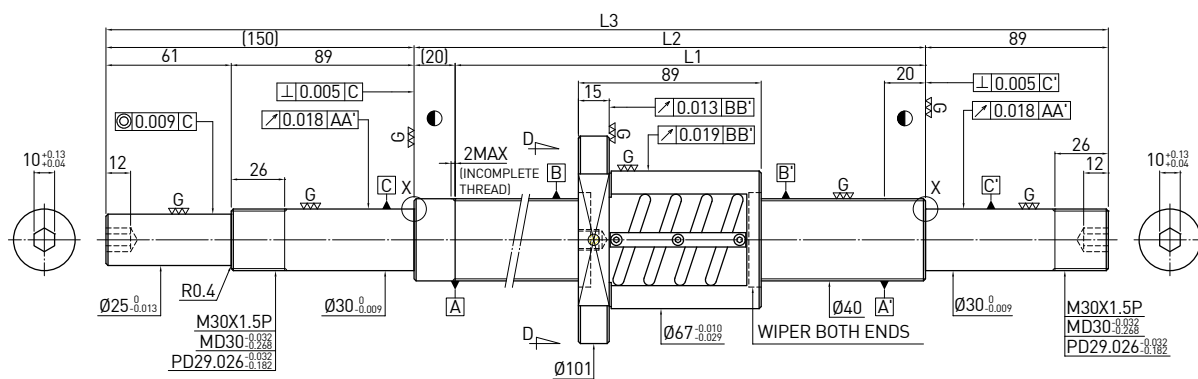


Unit : mm

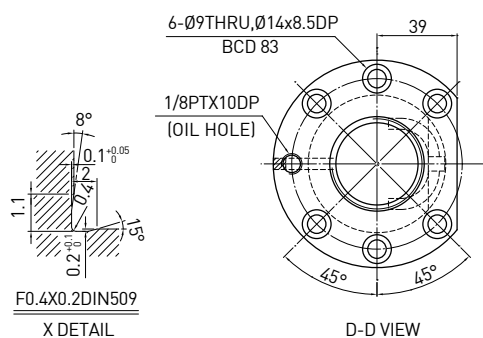
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
350	R36-10B1-OFSW-480-739-0.018	480	500	739	5
550	R36-10B1-OFSW-680-939-0.018	680	700	939	5
850	R36-10B1-OFSW-980-1239-0.018	980	1000	1239	5
1250	R36-10B1-OFSW-1380-1639-0.018	1380	1400	1639	5
1650	R36-10B1-OFSW-1780-2039-0.018	1780	1800	2039	5

**OFSW** TYPE (SHAFT OD 40, LEAD 5)

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	5
Lead Angle	2.24°
P.C.D (mm)	40.6
Screw P.C.D (mm)	40.6
RD (mm)	37.324
Steel Ball (mm)	Ø3.175
Circuits	2.5x2
Dynamic Load C (Kgf)	2070
Static Load Co (Kgf)	7134
Axial Play (mm)	0
Drag Torque (Kgf-cm)	1.81-4.21
Spacer Ball	-

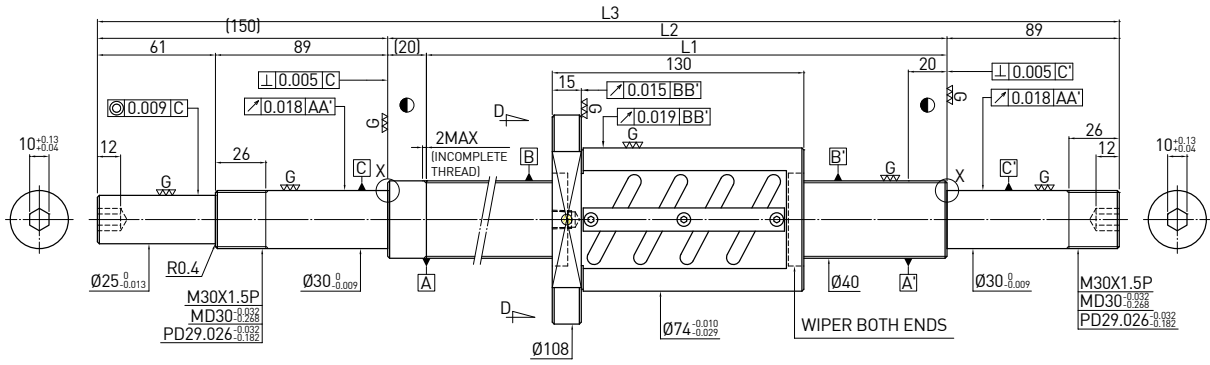


Unit : mm

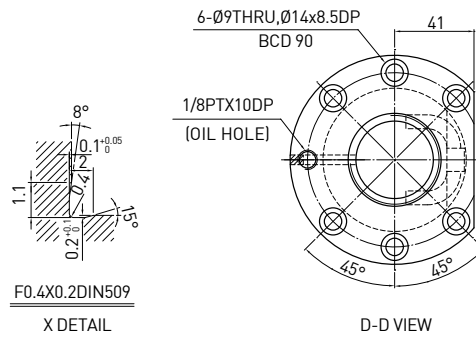
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
250	R40-5B2-OFSW-380-639-0.018	380	400	639	5
450	R40-5B2-OFSW-580-839-0.018	580	600	839	5
650	R40-5B2-OFSW-780-1039-0.018	780	800	1039	5
850	R40-5B2-OFSW-980-1239-0.018	980	1000	1239	5
1050	R40-5B2-OFSW-1180-1439-0.018	1180	1200	1439	5
1450	R40-5B2-OFSW-1580-1839-0.018	1580	1600	1839	5

**O F S W TYPE (SHAFT OD 40, LEAD 8)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	8
Lead Angle	3.55°
P.C.D (mm)	41
Screw P.C.D (mm)	41
RD (mm)	36.132
Steel Ball (mm)	Ø4.763
Circuits	2.5x2
Dynamic Load C (Kgf)	3634
Static Load Co (Kgf)	10603
Axial Play (mm)	0
Drag Torque (Kgf-cm)	4.24-8.82
Spacer Ball	-

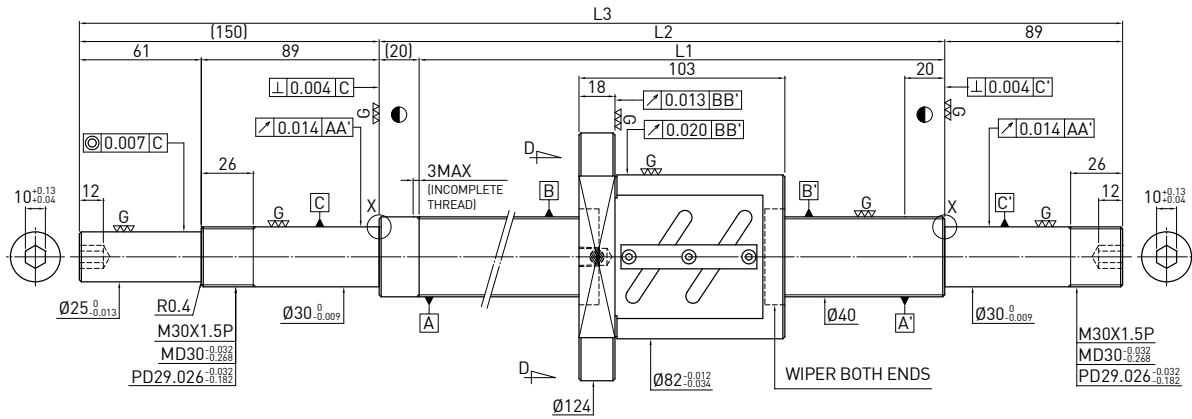


Unit : mm

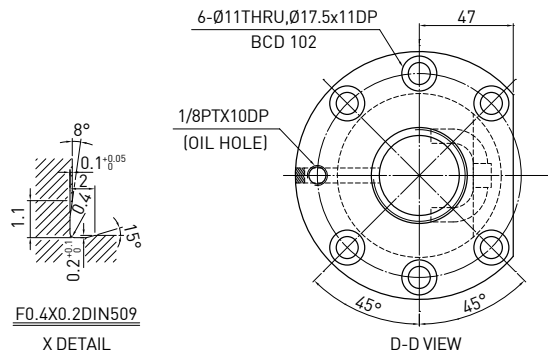
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
200	R40-8B2-OFSW-380-639-0.018	380	400	639	5
400	R40-8B2-OFSW-580-839-0.018	580	600	839	5
600	R40-8B2-OFSW-780-1039-0.018	780	800	1039	5
800	R40-8B2-OFSW-980-1239-0.018	980	1000	1239	5
1000	R40-8B2-OFSW-1180-1439-0.018	1180	1200	1439	5
1400	R40-8B2-OFSW-1580-1839-0.018	1580	1600	1839	5

**O F S W TYPE (SHAFT OD 40, LEAD 10)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	4.4°
P.C.D (mm)	41.4
Screw P.C.D (mm)	41.4
RD (mm)	34.91
Steel Ball (mm)	Ø6.35
Circuits	2.5x1
Dynamic Load C (Kgf)	2958
Static Load Co (Kgf)	7069
Axial Play (mm)	0
Drag Torque (Kgf-cm)	4.57-8.49
Spacer Ball	-

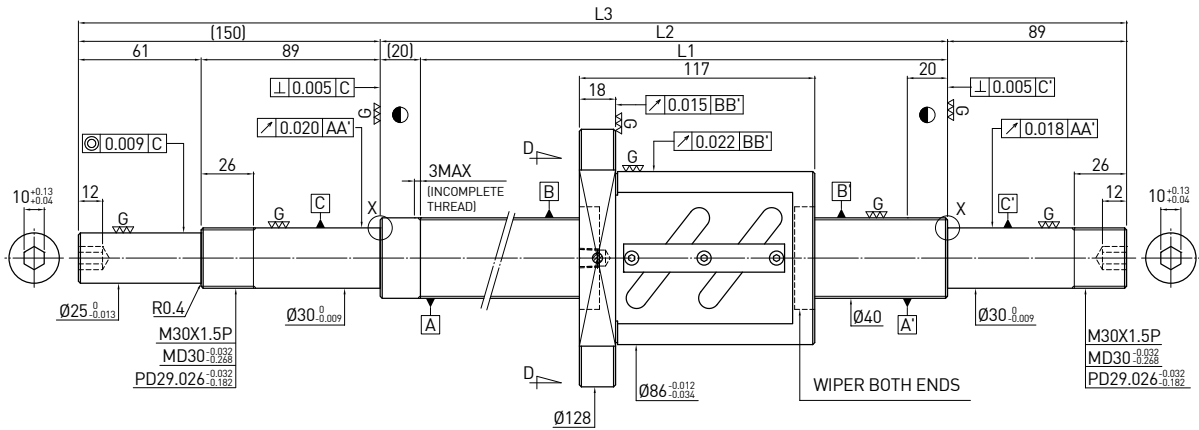


Unit : mm

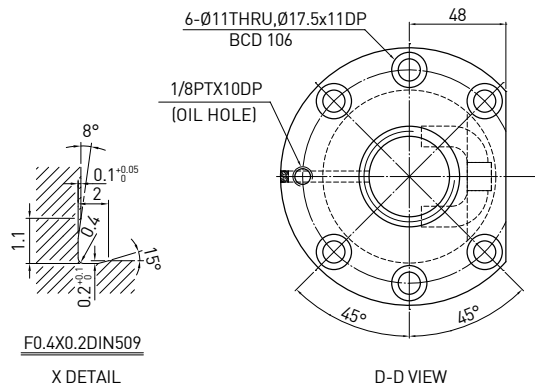
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
350	R40-10B1-OFSW-480-739-0.018	480	500	739	5
450	R40-10B1-OFSW-580-839-0.018	580	600	839	5
550	R40-10B1-OFSW-680-939-0.018	680	700	939	5
650	R40-10B1-OFSW-780-1039-0.018	780	800	1039	5
850	R40-10B1-OFSW-980-1239-0.018	980	1000	1239	5
1050	R40-10B1-OFSW-1180-1439-0.018	1180	1200	1439	5
1250	R40-10B1-OFSW-1380-1639-0.018	1380	1400	1639	5
1450	R40-10B1-OFSW-1580-1839-0.018	1580	1600	1839	5
1650	R40-10B1-OFSW-1780-2039-0.018	1780	1800	2039	5
2250	R40-10B1-OFSW-2380-2639-0.018	2380	2400	2639	5

**O F S W** TYPE (SHAFT OD 40, LEAD 12)

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	12
Lead Angle	5.25°
P.C.D (mm)	41.6
Screw P.C.D (mm)	41.6
RD (mm)	34.299
Steel Ball (mm)	Ø7.144
Circuits	2.5x1
Dynamic Load C (Kgf)	3425
Static Load Co (Kgf)	7837
Axial Play (mm)	0
Drag Torque (Kgf-cm)	5.93-11.01
Spacer Ball	-



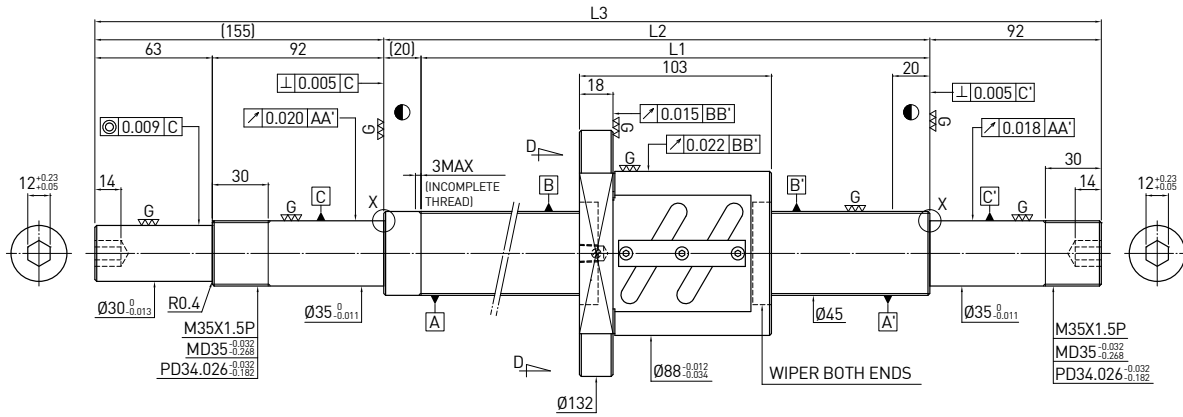
Unit : mm

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

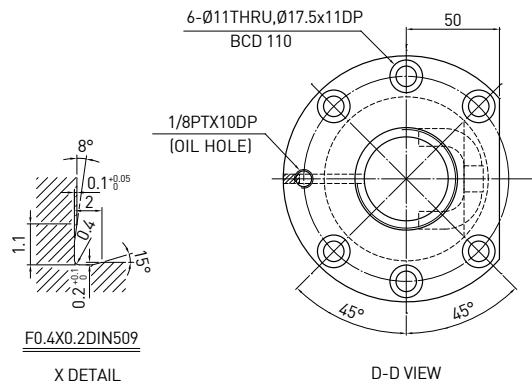


**O F S W TYPE (SHAFT OD 45, LEAD 10)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	3.92°
P.C.D (mm)	46.4
Screw P.C.D (mm)	46.4
RD (mm)	39.91
Steel Ball (mm)	$\varnothing 6.35$
Circuits	2.5x1
Dynamic Load C (Kgf)	3115
Static Load Co (Kgf)	7952
Axial Play (mm)	0
Drag Torque (Kgf-cm)	4.58~9.5
Spacer Ball	-



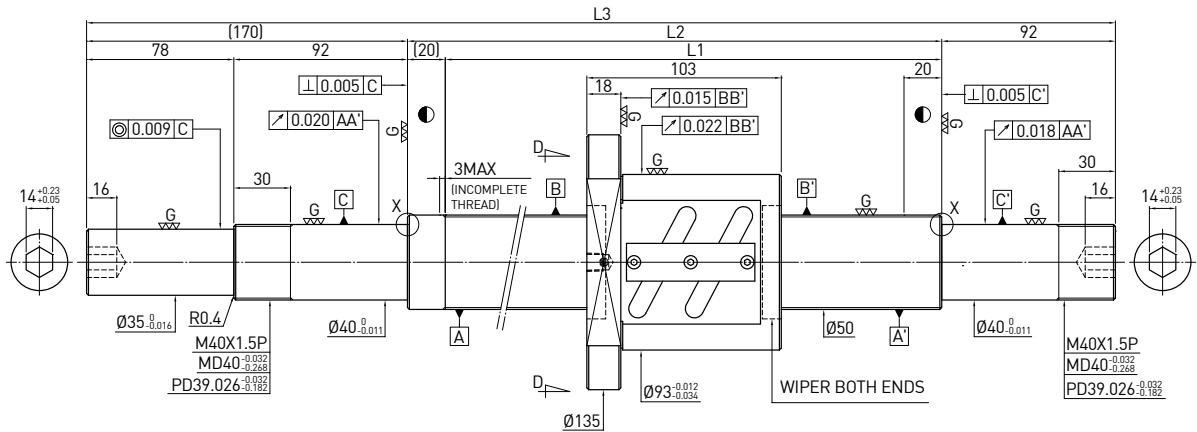
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
550	R45-10B1-OFSW-680-947-0.018	680	700	947	5
850	R45-10B1-OFSW-980-1247-0.018	980	1000	1247	5
1250	R45-10B1-OFSW-1380-1647-0.018	1380	1400	1647	5
1650	R45-10B1-OFSW-1780-2047-0.018	1780	1800	2047	5
2350	R45-10B1-OFSW-2480-2747-0.018	2480	2500	2747	5

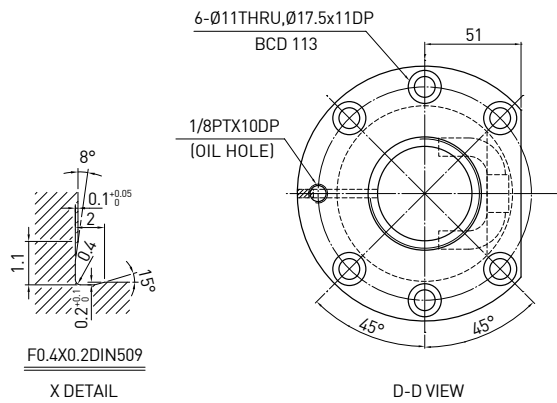


**TYPE (SHAFT OD 50, LEAD 10)**

◀ Standard



Ball screw Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	3.54°
P.C.D (mm)	51.4
Screw P.C.D (mm)	51.4
RD (mm)	44.91
Steel Ball (mm)	Ø6.35
Circuits	2.5x1
Dynamic Load C (Kgf)	3263
Static Load Co (Kgf)	8835
Axial Play (mm)	0
Drag Torque (Kgf-cm)	4.84~11.28
Spacer Ball	-



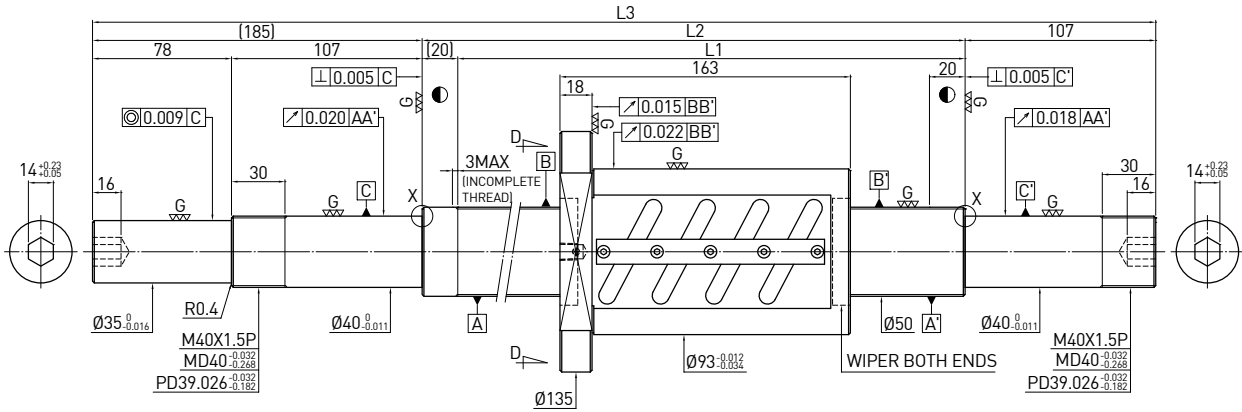
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
450	R50-10B1-OFSW-580-862-0.018	580	600	862	5
650	R50-10B1-OFSW-780-1062-0.018	780	800	1062	5
850	R50-10B1-OFSW-980-1262-0.018	980	1000	1262	5
1050	R50-10B1-OFSW-1180-1462-0.018	1180	1200	1462	5
1350	R50-10B1-OFSW-1480-1762-0.018	1480	1500	1762	5
1850	R50-10B1-OFSW-1980-2262-0.018	1980	2000	2262	5
2450	R50-10B1-OFSW-2580-2862-0.018	2580	2600	2862	5

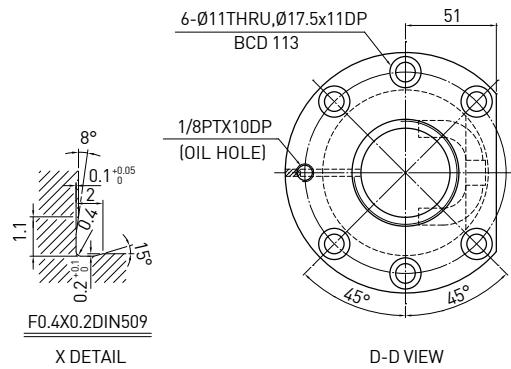


**TYPE (SHAFT OD 50, LEAD 10)**

◀ Standard



Ballscrew Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	3.54°
P.C.D (mm)	51.4
Screw P.C.D (mm)	51.4
RD (mm)	44.91
Steel Ball (mm)	Ø6.35
Circuits	2.5x2
Dynamic Load C (Kgf)	5923
Static Load Co (Kgf)	17670
Axial Play (mm)	0
Drag Torque (Kgf-cm)	10.48-17.48
Spacer Ball	-



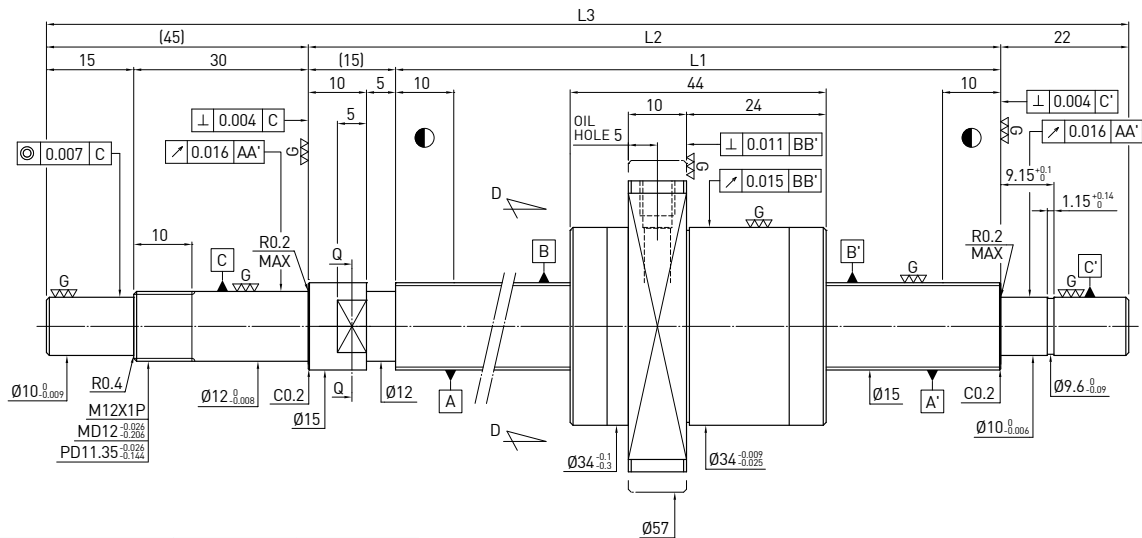
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
350	R50-10B2-OFSW-580-892-0.018	580	600	892	5
550	R50-10B2-OFSW-780-1092-0.018	780	800	1092	5
750	R50-10B2-OFSW-980-1292-0.018	980	1000	1292	5
950	R50-10B2-OFSW-1180-1492-0.018	1180	1200	1492	5
1250	R50-10B2-OFSW-1480-1792-0.018	1480	1500	1792	5
1750	R50-10B2-OFSW-1980-2292-0.018	1980	2000	2292	5
2350	R50-10B2-OFSW-2580-2892-0.018	2580	2600	2892	5

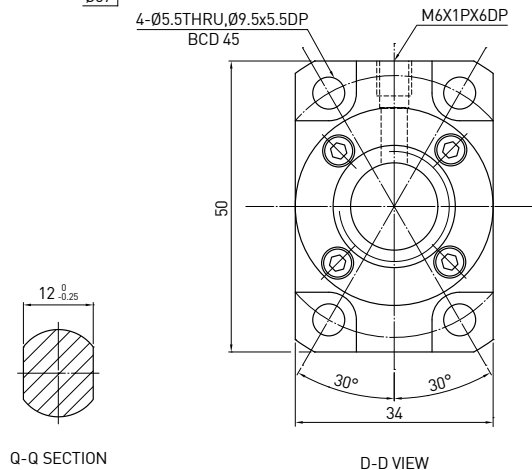
## 6.5 High Lead Ground Ballscrew

**D F S H** TYPE (SHAFT OD 15, LEAD 10)

◀ High Lead



Ballscrew Data	
Direction	Right Hand
Lead (mm)	10
Lead Angle	11.53°
P.C.D (mm)	15.6
Screw P.C.D (mm)	15.6
RD (mm)	12.324
Steel Ball (mm)	Ø3.175
Circuits	2.8x2
Dynamic Load C (Kgf)	940      1490
Static Load Co (Kgf)	1590      3190
Axial Play (mm)	0      0.005 or less
Drag Torque (Kgf-cm)	0.2~1      -
Spacer Ball	1 : 1      -

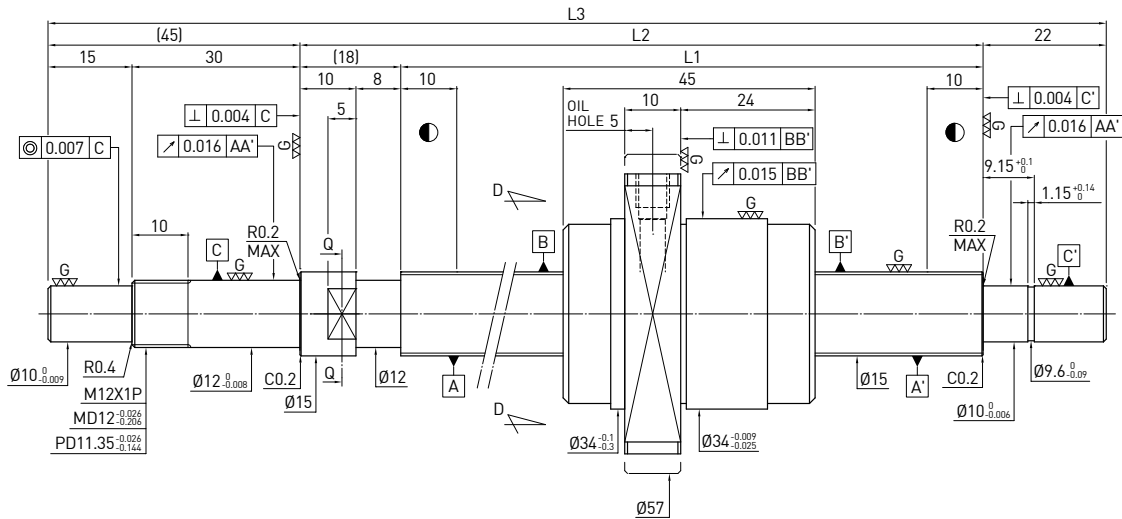


Unit : mm

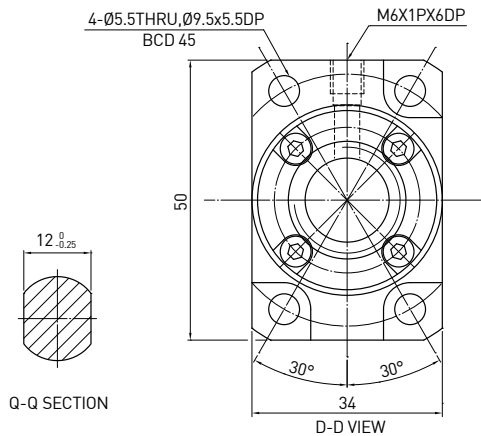
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	2R15-10U2-DFSH-239-321-0.018	239	254	321	5
200	2R15-10U2-DFSH-289-371-0.018	289	304	371	5
250	2R15-10U2-DFSH-339-421-0.018	339	354	421	5
300	2R15-10U2-DFSH-389-471-0.018	389	404	471	5
350	2R15-10U2-DFSH-439-521-0.018	439	454	521	5
400	2R15-10U2-DFSH-489-571-0.018	489	504	571	5
450	2R15-10U2-DFSH-539-621-0.018	539	554	621	5
500	2R15-10U2-DFSH-589-671-0.018	589	604	671	5
550	2R15-10U2-DFSH-639-721-0.018	639	654	721	5
600	2R15-10U2-DFSH-689-771-0.018	689	704	771	5
700	2R15-10U2-DFSH-789-871-0.018	789	804	871	5
800	2R15-10U2-D FSH-889-971-0.018	889	904	971	5

**D F S H TYPE (SHAFT OD 15, LEAD 20)**

◀ High Lead



Ball screw Data	
Direction	Right Hand
Lead (mm)	20
Lead Angle	22.2°
P.C.D (mm)	15.6
Screw P.C.D (mm)	15.6
RD (mm)	12.324
Steel Ball (mm)	$\varnothing 3.175$
Circuits	1.8x2
Dynamic Load C (Kgf)	620      990
Static Load Co (Kgf)	1030      2070
Axial Play (mm)	0      0.005 or less
Drag Torque (Kgf-cm)	0.2-0.9      -
Spacer Ball	1 : 1      -

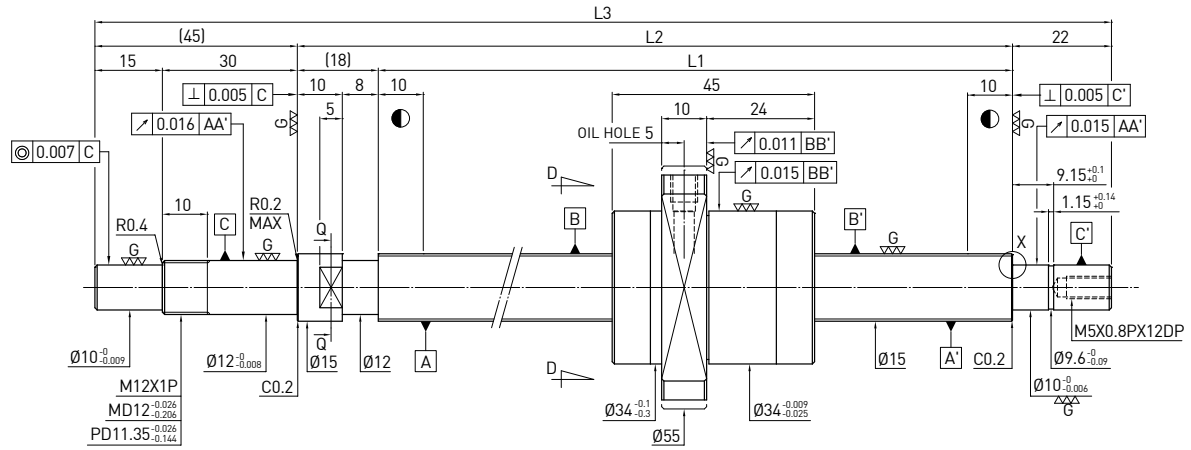


Unit : mm

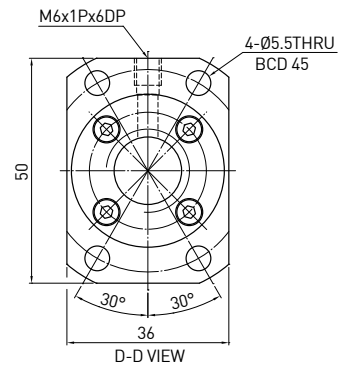
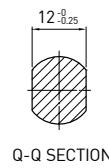
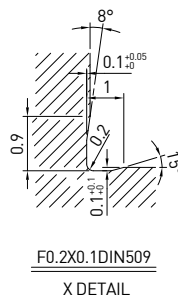
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	2R15-20S2-DFSH-236-321-0.018	236	254	321	5
200	2R15-20S2-DFSH-286-371-0.018	286	304	371	5
250	2R15-20S2-DFSH-336-421-0.018	336	354	421	5
300	2R15-20S2-DFSH-386-471-0.018	386	404	471	5
350	2R15-20S2-DFSH-436-521-0.018	436	454	521	5
400	2R15-20S2-DFSH-486-571-0.018	486	504	571	5
450	2R15-20S2-DFSH-536-621-0.018	536	554	621	5
500	2R15-20S2-DFSH-586-671-0.018	586	604	671	5
550	2R15-20S2-DFSH-636-721-0.018	636	654	721	5
600	2R15-20S2-DFSH-686-771-0.018	686	704	771	5
700	2R15-20S2-DFSH-786-871-0.018	786	804	871	5
800	2R15-20S2-DFSH-886-971-0.018	886	904	971	5

**F S H TYPE (SHAFT OD 15, LEAD 20)**

◀ High Lead



Ball screw Data	
Direction	Right Hand
Lead (mm)	20
Lead Angle	22.2°
P.C.D (mm)	15.6
Screw P.C.D (mm)	15.6
RD (mm)	12.324
Steel Ball (mm)	Ø3.175
Circuits	1.8x1
Dynamic Load C (Kgf)	340      540
Static Load Co (Kgf)	510      1030
Axial Play (mm)	0      0.005 or less
Drag Torque (Kgf-cm)	0.15-0.8      0.24MAX
Spacer Ball	1 : 1      -

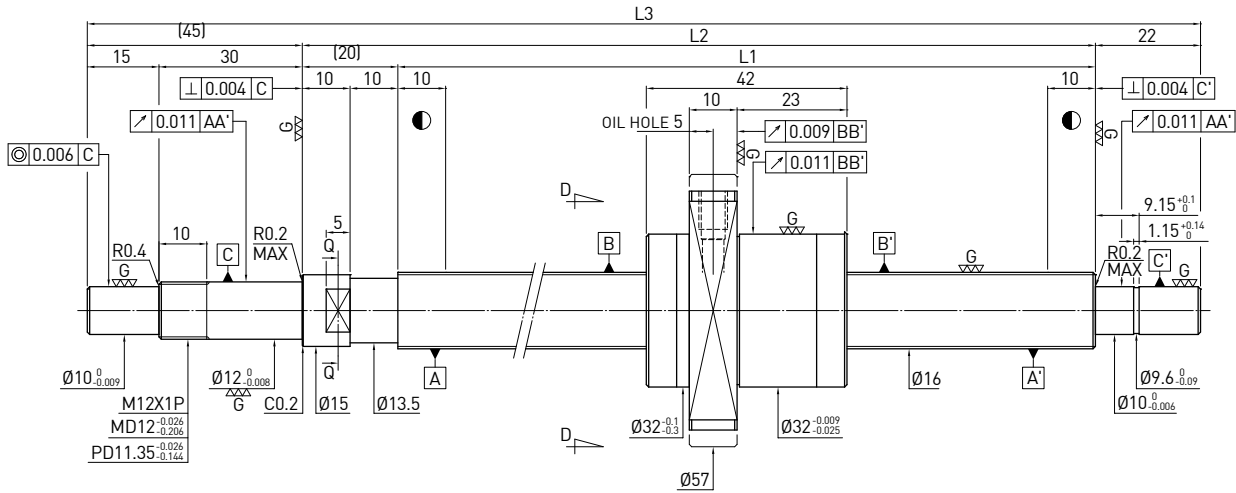


Unit : mm

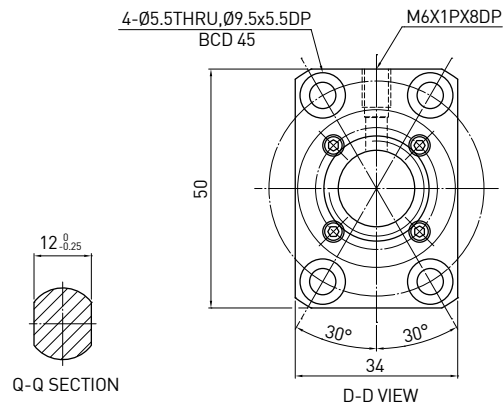
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
100	R15-20S1-FSH-186-271-0.018	186	204	271	5
150	R15-20S1-FSH-236-321-0.018	236	254	321	5
200	R15-20S1-FSH-286-371-0.018	286	304	371	5
250	R15-20S1-FSH-336-421-0.018	336	354	421	5
300	R15-20S1-FSH-386-471-0.018	386	404	471	5
350	R15-20S1-FSH-436-521-0.018	436	454	521	5
400	R15-20S1-FSH-486-571-0.018	486	504	571	5
450	R15-20S1-FSH-536-621-0.018	536	554	621	5
500	R15-20S1-FSH-586-671-0.018	586	604	671	5
550	R15-20S1-FSH-636-721-0.018	636	654	721	5
600	R15-20S1-FSH-686-771-0.018	686	704	771	5
700	R15-20S1-FSH-786-871-0.018	786	804	871	5
800	R15-20S1-FSH-886-971-0.018	886	904	971	5
1000	R15-20S1-FSH-1086-1171-0.018	1086	1104	1171	5

**D F S H** TYPE (SHAFT OD 16, LEAD 16)

◀ High Lead



Ball screw Data	
Direction	Right Hand
Lead (mm)	16
Lead Angle	17.06°
P.C.D (mm)	16.6
Screw P.C.D (mm)	16.6
RD (mm)	13.324
Steel Ball (mm)	Ø3.175
Circuits	1.8x2
Dynamic Load C (Kgf)	670      1060
Static Load Co (Kgf)	1140      2280
Axial Play (mm)	0      0.005 or less
Drag Torque (Kgf-cm)	0.2-1      -
Spacer Ball	1 : 1      -



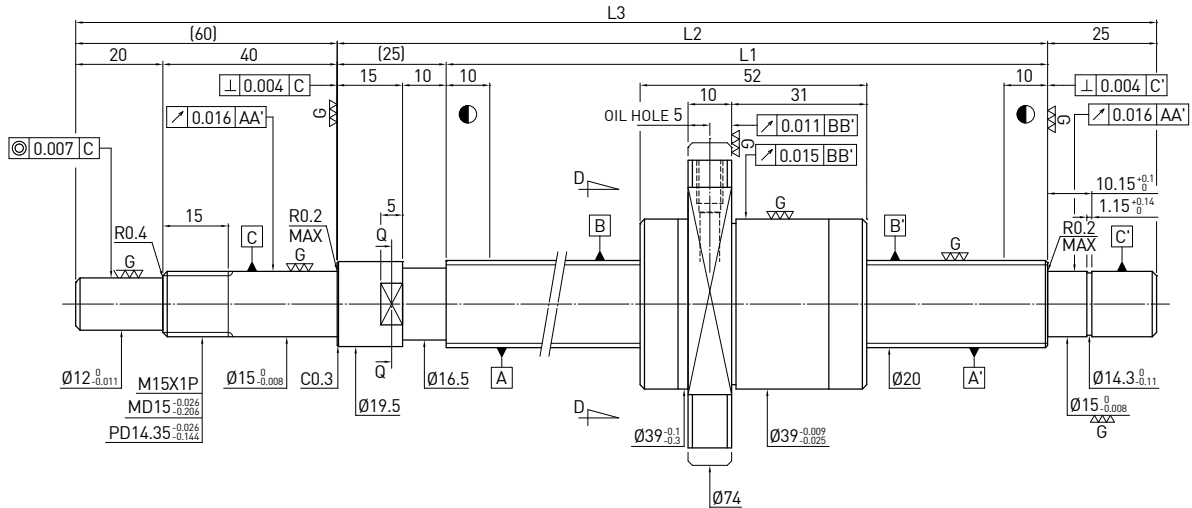
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
150	2R16-16S2-DFSH-234-321-0.018	234	254	321	5
200	2R16-16S2-DFSH-284-371-0.018	284	304	371	5
250	2R16-16S2-DFSH-334-421-0.018	334	354	421	5
300	2R16-16S2-DFSH-384-471-0.018	384	404	471	5
350	2R16-16S2-DFSH-434-521-0.018	434	454	521	5
400	2R16-16S2-DFSH-484-571-0.018	484	504	571	5
450	2R16-16S2-DFSH-534-621-0.018	534	554	621	5
500	2R16-16S2-DFSH-584-671-0.018	584	604	671	5
550	2R16-16S2-DFSH-634-721-0.018	634	654	721	5
600	2R16-16S2-DFSH-684-771-0.018	684	704	771	5
700	2R16-16S2-DFSH-784-871-0.018	784	804	871	5
800	2R16-16S2-DFSH-884-971-0.018	884	904	971	5

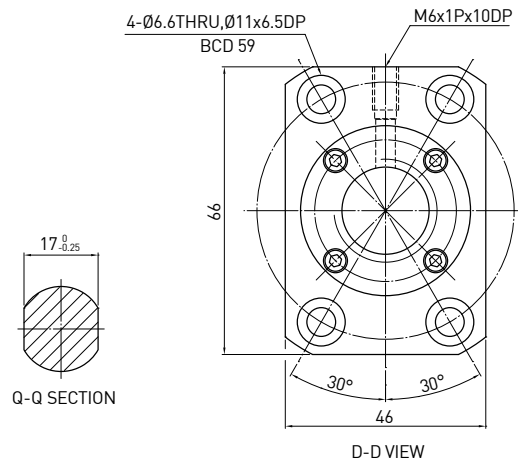


**TYPE (SHAFT OD 20, LEAD 20)**

◀ High Lead



Ball screw Data		
Direction	Right Hand	
Lead (mm)	20	
Lead Angle	17.17°	
P.C.D (mm)	20.6	
Screw P.C.D (mm)	20.6	
RD (mm)	17.324	
Steel Ball (mm)	Ø3.175	
Circuits	1.8x2	
Dynamic Load C (Kgf)	740	1180
Static Load Co (Kgf)	1430	2860
Axial Play (mm)	0	0.005 or less
Drag Torque (Kgf-cm)	0.1~1	-
Spacer Ball	1 : 1	-



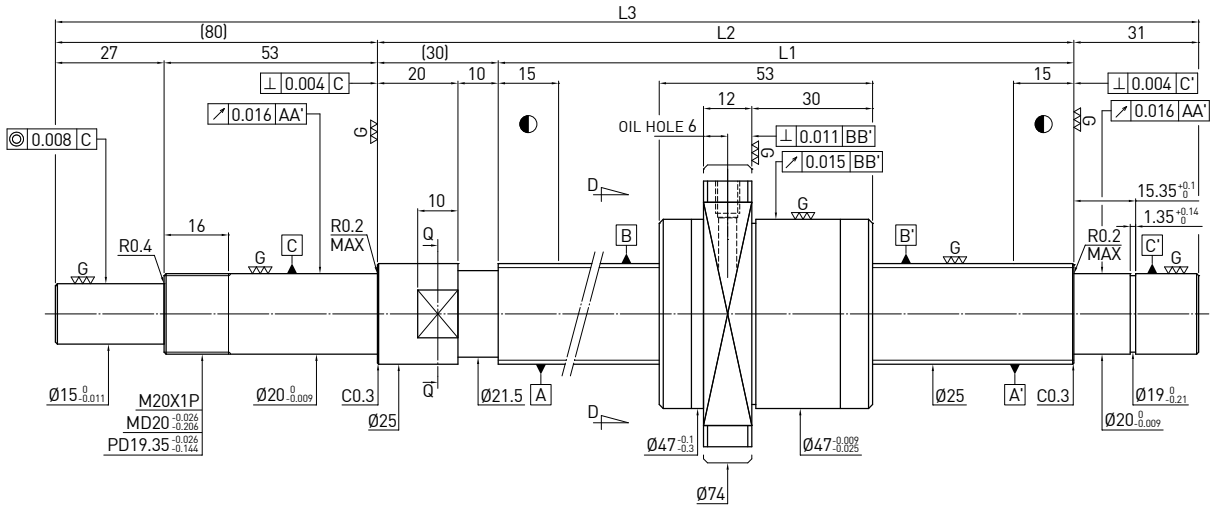
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
300	2R20-20S2-DFSH-410-520-0.018	410	435	520	5
400	2R20-20S2-DFSH-510-620-0.018	510	535	620	5
500	2R20-20S2-DFSH-610-720-0.018	610	635	720	5
600	2R20-20S2-DFSH-710-820-0.018	710	735	820	5
700	2R20-20S2-DFSH-810-920-0.018	810	835	920	5
800	2R20-20S2-DFSH-910-1020-0.018	910	935	1020	5
900	2R20-20S2-DFSH-1010-1120-0.018	1010	1035	1120	5
1000	2R20-20S2-DFSH-1110-1220-0.018	1110	1135	1220	5
1100	2R20-20S2-DFSH-1210-1320-0.018	1210	1235	1320	5

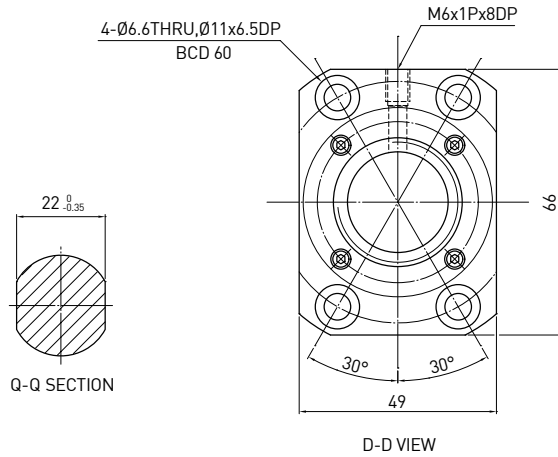


**D F S H** TYPE (SHAFT OD 25, LEAD 20)

◀ High Lead



Ballscrew Data		
Direction	Right Hand	
Lead (mm)	20	
Lead Angle	13.86°	
P.C.D (mm)	25.8	
Screw P.C.D (mm)	25.8	
RD (mm)	21.744	
Steel Ball (mm)	Ø3.969	
Circuits	1.8x2	
Dynamic Load C (Kgf)	1140	1810
Static Load Co (Kgf)	2270	4540
Axial Play (mm)	0	0.005 or less
Drag Torque (Kgf-cm)	0.2~1	-
Spacer Ball	1 : 1	-



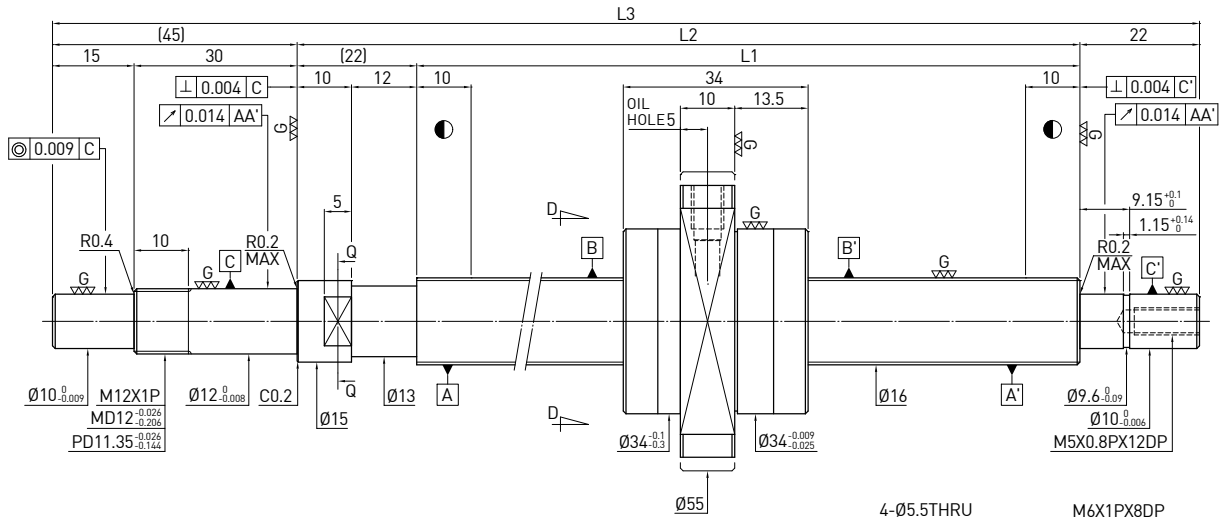
Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
500	2R25-20S2-DFSH-610-751-0.018	610	640	751	5
600	2R25-20S2-DFSH-710-851-0.018	710	740	851	5
800	2R25-20S2-DFSH-910-1051-0.018	910	940	1051	5
1000	2R25-20S2-DFSH-1110-1251-0.018	1110	1140	1251	5
1200	2R25-20S2-DFSH-1310-1451-0.018	1310	1340	1451	5
1400	2R25-20S2-DFSH-1510-1651-0.018	1510	1540	1651	5
1600	2R25-20S2-DFSH-1710-1851-0.018	1710	1740	1851	5

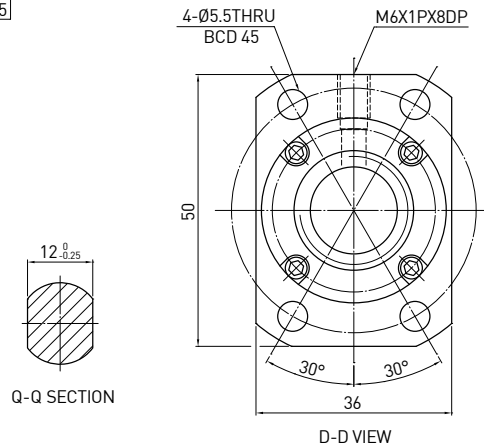
## 6.6 Ultra High Lead Ground Ballscrew

**D F S H** 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
Screw P.C.D (mm)	16.6
RD (mm)	13.324
Steel Ball (mm)	Ø3.175
Circuits	0.8x2
Dynamic Load C (Kgf)	490
Static Load Co (Kgf)	1010
Axial Play (mm)	0      0.005 MAX
Drag Torque (Kgf-cm)	0.15~1.0      0.24 MAX
Spacer Ball	-      -

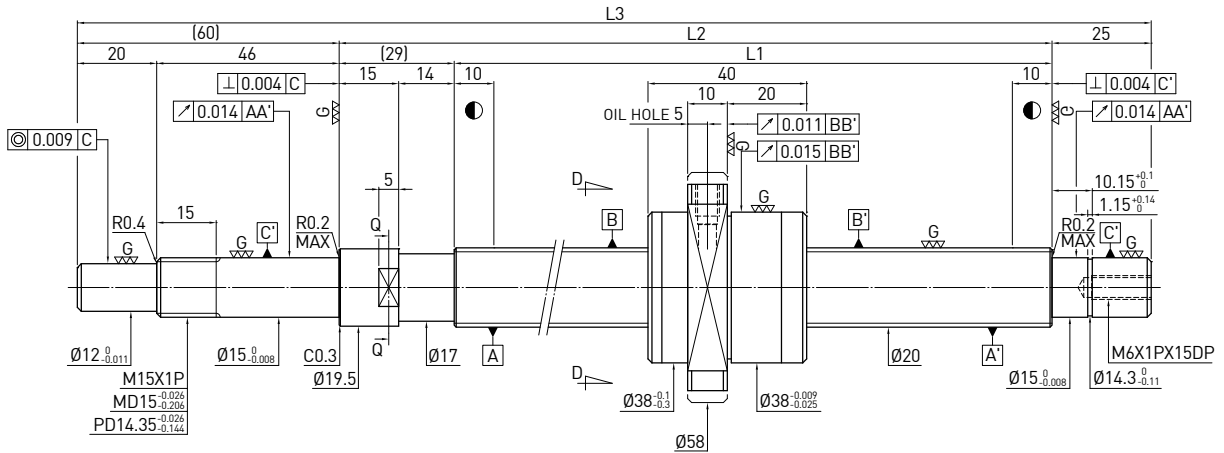


Unit : mm

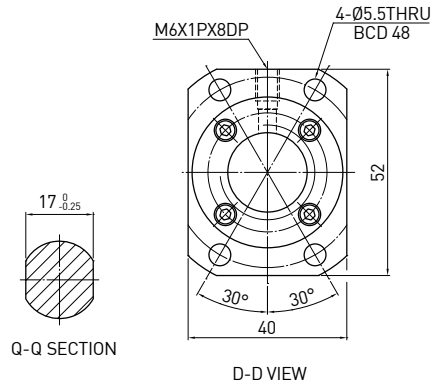
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
300	2R16-32V2-DFSH-382-471-0.018	382	404	471	5
500	2R16-32V2-DFSH-582-671-0.018	582	604	671	5
800	2R16-32V2-DFSH-882-971-0.018	882	904	971	5
1200	2R16-32V2-DFSH-1282-1371-0.018	1282	1304	1371	5

**D F S H TYPE (SHAFT OD 20, LEAD 40)**

◀ Ultra High Lead



Ball screw Data	
Direction	Right Hand
Lead (mm)	40
Lead Angle	31.47°
P.C.D (mm)	20.8
Screw P.C.D (mm)	20.8
RD (mm)	17.324
Steel Ball (mm)	$\varnothing 3.175$
Circuits	0.8x2
Dynamic Load C (Kgf)	540
Static Load Co (Kgf)	1240
Axial Play (mm)	0      0.005 MAX
Drag Torque (Kgf-cm)	0.2-1.2      0.3 MAX
Spacer Ball	-      -

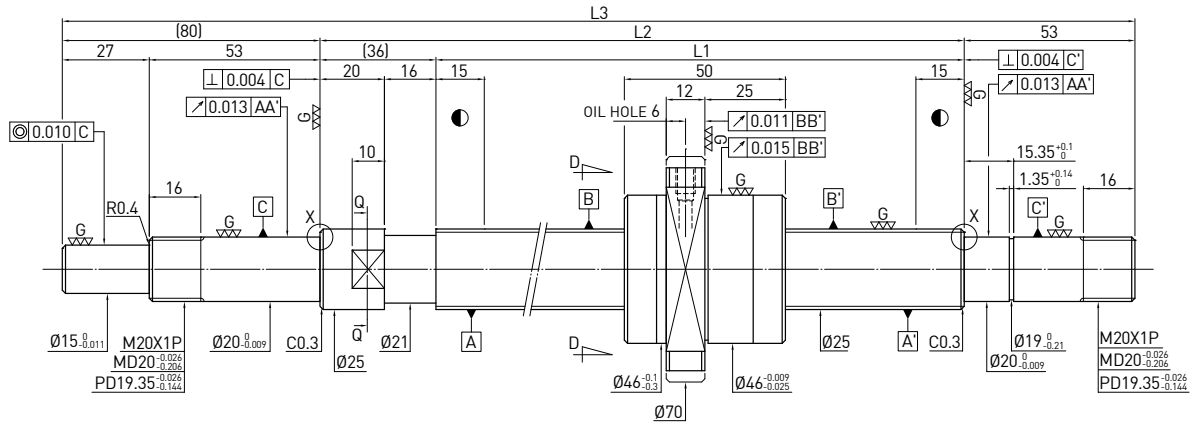


Unit : mm

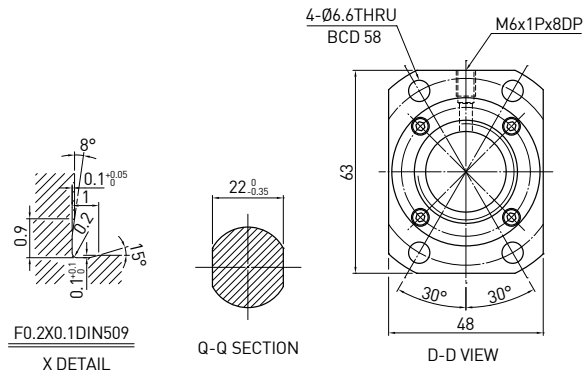
Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
400	2R20-40V2-DFSH-506- 620-0.018	506	535	620	5
600	2R20-40V2-DFSH-706- 820-0.018	706	735	820	5
800	2R20-40V2-DFSH-906- 1020-0.018	906	935	1020	5
1000	2R20-40V2-DFSH-1106- 1220-0.018	1106	1135	1220	5
1200	2R20-40V2-DFSH-1306- 1420-0.018	1306	1335	1420	5
1600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

**D F S H** TYPE (SHAFT OD 25, LEAD 50)

◀ Ultra High Lead



Ball screw Data	
Direction	Right Hand
Lead (mm)	50
Lead Angle	31.67°
P.C.D (mm)	25.8
Screw P.C.D (mm)	25.8
RD (mm)	21.744
Steel Ball (mm)	Ø3.969
Circuits	0.8x2
Dynamic Load C (Kgf)	800
Static Load Co (Kgf)	1930
Axial Play (mm)	0      0.005 or less
Drag Torque (Kgf-cm)	0.3-2.19      0.5MAX
Spacer Ball	-      -



Unit : mm

Stroke	HIWIN Code	L1	L2	L3	Accuracy grade
700	2R25-50V2-DFSH-844-1013-0.018	844	880	1013	5
1000	2R25-50V2-DFSH-1144-1313-0.018	1144	1180	1313	5
1500	2R25-50V2-DFSH-1644-1813-0.018	1644	1680	1813	5
2000	2R25-50V2-DFSH-2144-2313-0.018	2144	2180	2313	5

## 7. Rolled Ballscrews

### 7.1 Introduction

HIWIN Rolled Ballscrews are made by a rolling process of the screw spindle instead of a grinding process. Rolled ballscrews not only have the benefit of low friction and smooth running for the linear feed system compared with traditional screws, but also can be supplied with quick stock delivery and lower production price.

HIWIN uses the most advanced technology in the ballscrew rolling process, and maintains the homogeneous manufacturing procedure of selecting materials, rolling, heat treating, machining and assembling.

In general, rolled ballscrews use the same preload method as the precision ground ballscrews, except that there are some differences in the lead error definition and the geometric tolerance. The grade of the rolled ballscrews can be ordered according to the same nut dimension of the precision ground ballscrew. If the ends of the spindle are unmachined, the geometric tolerance does not apply. The production scale of each type of the ballscrews and the accuracy classification are described in the following sections (the unit of length used is in mm).

### 7.2 Precision Rolled Ballscrews

Table 7.1 gives the lead accuracy of the precision rolled ballscrews. The lead accuracy is measured by the accumulated lead error of any portion of 300 mm in length. The maximum axial plays of the precision rolled ballscrews are shown in Table 7.2. These ballscrews can be preloaded as the precision ground ones. The categories of the precision rolled ballscrews are listed in Table 7.3.

Fig. 7.1 shows the geometric tolerance of the general rolled ballscrews. HIWIN has a variety of precision rolled ballscrews for our customers' urgent requirements.

Table 7.1 Accuracy grade of precision rolled ballscrew

Unit : 0.001mm

Cumulative	C6	C7	C8	C10
$v_{300}$	23	50	100	210
$e_p$	$e_p = \frac{\text{length measured}}{300} \times v_{300}$			

length measured \ Cumulative $v_{300}$	C6	C7	C8	C10
	0~100	18	44	84
101~200	20	48	92	194
201~315	23	50	100	210

Measuring length unit: mm

Table 7.2 Maximum axial play of precision rolled ballscrew

Unit : mm

Ball diameter	≤ 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

Table 7.3 Category of HIWIN precision rolled ballscrew

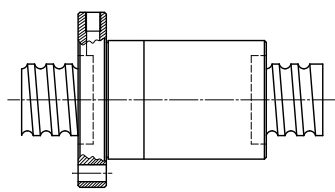
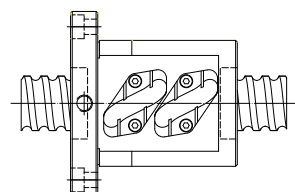
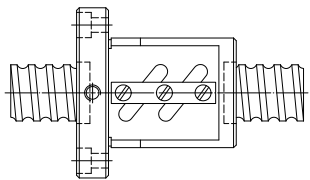
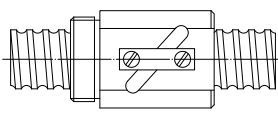
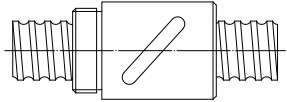
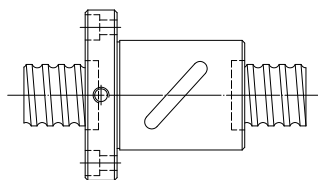
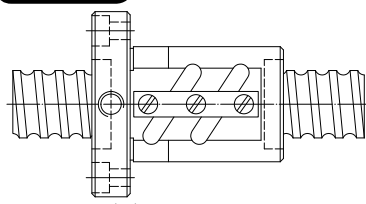
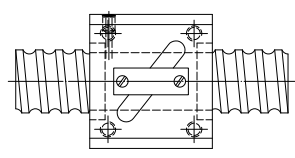
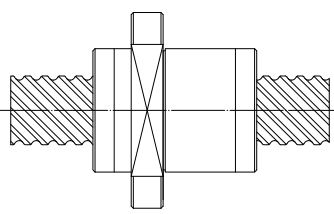
Unit : mm

Nominal diameter do (mm)	Lead																			Max.screw length			
	1	1.25	2	2.5	3	4	5	5.08	6	8	10	12	16	20	25	30	32	36	40		50	63	
6	●	●																					800
8	●		●	■	●		●																800
10			●	■	●	●	●		●		●												1000
12			●	■	●	■	●	●		●	●	●											1200
14					●	●	●				●												2000
15											●						●						2000
16	●		■	■		●	■	●	●	●	■	●	●				●						3000
18										●													3000
20				■		●	■	■	●	●	●			■					●				3000
22							●				●												3000
25				●		●	■	■	●	●	■					●							4000
28							●		●														4000
32						■	■	■	●	●	■					●		●		●			4500
36							●		●	●	●	●	●		●		●		●				4500
38											■		●	●						●			5600
40							■		●	●	■	●	●	●	●					●			5600
45											●	●		●									5600
48											●			●									5600
50							●		●		■	●	●	●		●				●		●	5600
55									●		●												5600
63											■	●	●	■						●		●	5600
80											●		●	●		●							6500

■ : Right turn and left turn    ● : Right turn only. Please contact Hiwin for special request

Note: The maximum length for ballscrew is based on grade C7. For rolled ballscrew, the maximum length varies according to lead accuracy grade.

### 7.3 General Type of Rolled Ballscrews

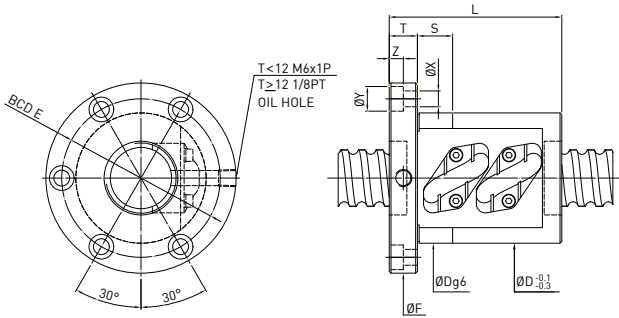
page	General Type		page
154	<p><b>FSC</b></p>  <p>(F)Flange end, (S)single nut, (C)Super S</p>	<p><b>FST</b></p>  <p>(F)Flange end, (S)single nut, (T)Super T</p>	155
156	<p><b>FSW</b></p>  <p>(F)Flange end, (S)single nut, (W)tube within the nut diameter</p>	<p><b>RSV</b></p>  <p>(R)Round, (S)single nut, (V)tube above the nut diameter</p>	157
158	<p><b>RSB</b></p>  <p>(R)Round, (S)single nut, (B)bonded return tube</p>	<p><b>FSB</b></p>  <p>(F)Flange end, (S)single nut, (B)bonded return tube</p>	159
160	<p><b>FSV</b></p>  <p>(F)Flange end, (S)single nut, (V)tube above the nut diameter</p>	<p><b>SSV</b></p>  <p>(S)Square, (S)single nut, (V)tube above the nut diameter</p>	161
page	High Lead Type		page
162	<p><b>FSH</b></p>  <p>Large lead, (F)flange mounted, (S)single nut, (H)end cap</p>		162



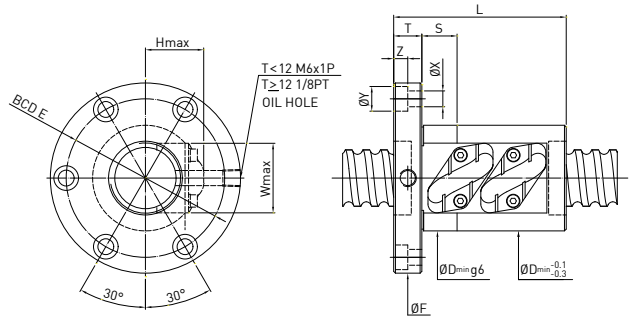


**F S T** TYPE

◀ Standard Product



Re-circulation plate below the nut body

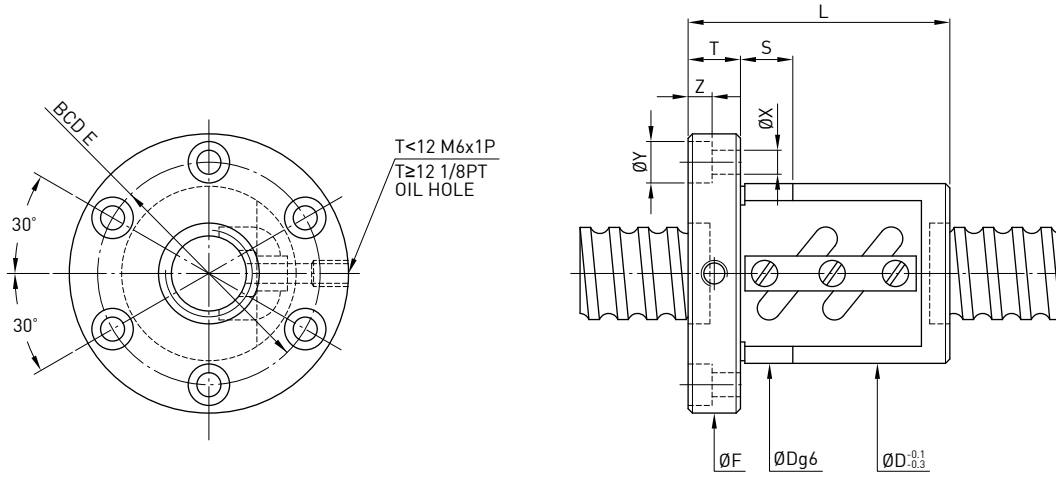


Re-circulation plate above the nut body

Model	Size		Ball Dia.	Circuits	Dynamic Load C(kgf)	Static Load Col(kgf)	Nut			Flange			Return Tube		Bolt			Fit
	Nominal Dia.	Lead					D	D <sub>min</sub>	L	F	T	BCD-E	W	H	X	Y	Z	
R8-3A1	8	3	2	1.6x1	200	310	21	17	28	36	5	28	14	12	4.5	0	0	0
R8-5B1	8	5	2	2.6X1	320	540	24	18	37	44	8	34	15	13	4.5	8	4	0
R10-4B1	10	4	2	2.6X1	350	650	24	20	39	46	10	36	16	13	4.5	8	4	10
R10-5A1	10	5	2	1.6x1	230	390	23	19	30	46	10	36	15	13	4.5	8	4	10
R10-4B1	10	4	2.381	2.6X1	450	780	27	23	41	49	10	37	17	16	4.5	8	4	10
R12-5B1	12	5	2.381	2.6X1	510	980	31	24	40	50	10	40	18	18	4.5	8	4	12
R12-6B1	12	6	2.381	2.6X1	500	980	29	24	43	50	10	40	20	16	4.5	8	4	12
R12-10A1	12	10	2.381	1.6x1	320	590	30	24	42	50	10	40	17	17	4.5	8	4	12
R12-10B1	12	10	2.381	2.6X1	490	960	31	25	50	50	10	40	19	18	4.5	8	4	12
R14-4B1	14	4	2.381	2.6X1	540	1120	32	26	41	52	10	42	20	17	4.5	8	4	12
R15-10B1	15	10	3.175	2.6X1	810	1620	40	30	55	57	11	45	24	19	5.5	9.5	5.5	12
R15-20A1	15	20	3.175	1.6x1	520	1000	40	32	64	60	11	47	25	22	5.5	9.5	5.5	12
R16-5B1	16	5	3.175	2.6X1	860	1760	38	31	45	64	12	51	24	20	5.5	9.5	5.5	12
R16-5B2	16	5	3.175	2.6X2	1560	3520	38	31	60	64	12	51	24	20	5.5	9.5	5.5	12
R20-5B1	20	5	3.175	2.6X1	970	2230	42	37	45	68	12	55	26	23	5.5	9.5	5.5	12
R20-5B2	20	5	3.175	2.6X2	1760	4470	42	37	60	68	12	55	26	23	5.5	9.5	5.5	12
R25-4B2	25	4	2.381	2.6X2	1290	4130	45	41	48	69	11	57	29	23	5.5	9.5	5.5	12
R25-5B2	25	5	3.175	2.6X2	1950	5670	49	44	60	74	12	62	33	25	5.5	9.5	5.5	12
R25-25A1	25	25	3.969	1.6X1	930	2170	55	50	78	82	12	69	37	29	6.6	11	6.5	12
R25-10A2	25	10	4.763	1.6X2	2200	5190	55	49	75	86	15	73	35	30	6.6	11	6.5	12
R25-10B1	25	10	4.763	2.6X1	1840	4220	55	49	65	86	15	73	35	30	6.6	11	6.5	12
R25-10B2	25	10	4.763	2.6X2	3340	8440	55	49	97	86	15	73	35	30	6.6	11	6.5	12
R28-5B1	28	5	3.175	2.6X1	1130	3190	54	48	45	85	12	69	34	28	6.6	11	6.5	12
R28-5B2	28	5	3.175	2.6X2	2050	6390	54	48	60	85	12	69	34	28	6.6	11	6.5	12
R32-4B2	32	4	2.381	2.6X2	1430	5340	52	49	40	84	12	71	34	27	6.6	11	6.5	12
R32-5B2	32	5	3.175	2.6X2	2180	7340	57	52	60	84	12	71	34	29	6.6	11	6.5	12
R32-6B2	32	6	3.969	2.6X2	2970	9240	60	56	63	88	12	75	39	31	6.6	11	6.5	12
R32-10B2	32	10	3.969	2.6X2	2890	8850	58	54	87	84	12	71	38	31	6.6	11	6.5	12
R32-8B2	32	8	4.763	2.6X2	3710	10640	62	58	86	96	16	78	40	33	9	14	8.5	15
R32-25B1	32	25	4.763	2.6X1	2040	5430	63	58	110	102	16	84	41	32	9	14	8.5	15
R32-10B2	32	10	6.35	2.6X2	5640	15040	74	65	98	108	16	90	48	39	9	14	8.5	15
R36-10B2	36	10	6.35	2.6X2	5790	16030	72	65	102	125	18	98	45	38	11	17.5	11	15
R36-20B1	36	20	6.35	2.6X1	3140	7930	76	66	100	120	18	98	47	39	11	17.5	11	15
R40-8B2	40	8	4.763	2.6X2	4100	13320	75	72	86	108	16	90	47	37	9	14	8.5	15
R40-10B2	40	10	6.35	2.6X2	6100	17960	78	74	102	125	18	104	53	41	11	17.5	11	15
R40-16B2	40	16	6.35	2.6X2	6070	17860	81	73	139	128	18	106	48	41	11	17.5	11	15
R40-12B1	40	12	7.144	2.6X1	3940	10140	82	74	81	128	18	106	51	42	11	17.5	11	20
R40-12B2	40	12	7.144	2.6X2	7150	20290	82	74	117	128	18	106	51	42	11	17.5	11	20
R45-10B1	45	10	6.35	2.6X1	3620	10390	84	77	74	132	18	110	53	44	11	17.5	11	15
R45-10B2	45	10	6.35	2.6X2	6570	20780	84	77	104	132	18	110	53	44	11	17.5	11	15
R55-10B2	55	10	6.35	2.6X2	7000	24650	95	92	103	144	18	122	62	48	11	17.5	11	20

**F S W TYPE**

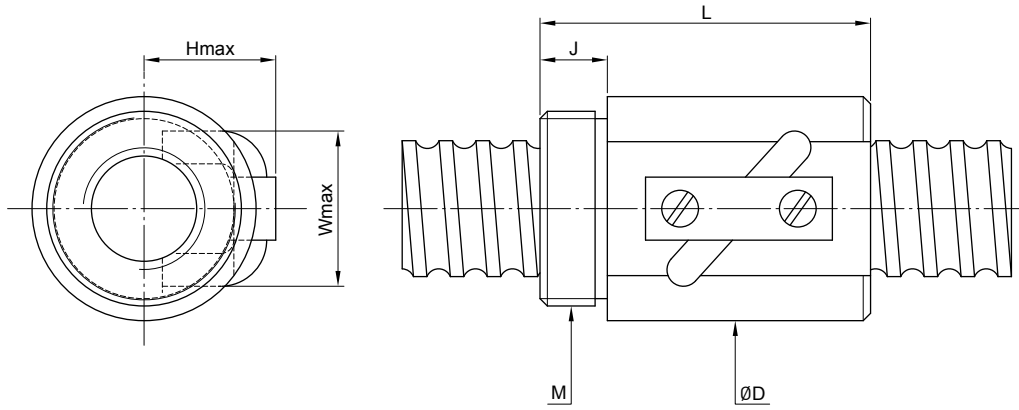
◀ Standard Product



Model	Size		Ball Dia.	Circuits	Dynamic Load 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	2.5	2.000	2.5x1	252	405	34	28	52	38	8	5.5	9.5	5.5	8		
10-4B1	10	4	2.381	2.5x1	304	466	41	30	53	41	10	5.5	9.5	5.5	10		
12-4B1	12	4	2.381	2.5x1	344	574	41	30	50	40	10	5.5	9.5	5.5	12		
16-4B1	16	4	2.381	2.5x1	390	744	39	36	59	48	10	5.5	9.5	5.5	12		
16-5B1	16	5	3.175	2.5x1	678	1226	45	40	64	51	12	5.5	9.5	5.5	12		
16-10B1	16	10	3.175	2.5x1	667	1194	60	42	66	54	10	5.5	9.5	5.5	12		
20-5B1	20	5	3.175	2.5x1	746	1526	45	44	68	55	12	5.5	9.5	5.5	12		
20-5B2	20	5	3.175	2.5x2	1353	3052	60	44	68	55	12	5.5	9.5	5.5	12		
20-5C1	20	5	3.175	3.5x1	1001	2149	50	44	68	55	12	5.5	9.5	5.5	12		
20-10B1	20	10	4.763	2.5x1	1280	2314	54	46	74	59	13	6.6	11	6.5	12		
25-5B2	25	5	3.175	2.5x2	1534	3975	60	50	74	62	12	5.5	9.5	5.5	12		
25-10B1	25	10	4.763	2.5x1	1459	2983	65	60	86	73	16	6.6	11	6.5	12		
25-10B2	25	10	4.763	2.5x2	2652	5966	97	58	85	71	15	6.6	11	6.5	12		
28-5B1	28	5	3.175	2.5x1	893	2252	43	54	76	64	12	6.6	11	6.5	12		
28-5B2	28	5	3.175	2.5x2	1621	4503	58	54	76	64	12	6.6	11	6.5	12		
28-6A2	28	6	3.969	1.5x2	1395	3337	55	55	85	65	12	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		
32-5C1	32	5	3.175	3.5x1	1200	3205	50	58	84	71	12	6.6	11	6.5	12		
32-6B2	32	6	3.969	2.5x2	2328	6317	63	62	89	75	12	6.6	11	6.5	12		
32-10B1	32	10	6.350	2.5x1	2416	5172	68	74	108	90	16	9	14	8.5	15		
32-10B2	32	10	6.350	2.5x2	4379	10345	98	74	108	90	16	9	14	8.5	15		
40-5B2	40	5	3.175	2.5x2	1859	6354	65	68	102	84	16	9	14	8.5	15		
40-6B2	40	6	3.969	2.5x2	2542	7967	72	70	104	86	16	9	14	8.5	15		
40-10B2	40	10	6.350	2.5x2	4812	12732	102	84	125	104	18	11	17.5	11	15		
40-12B2	40	12	7.144	2.5x2	5675	14433	117	90	130	110	18	11	17.5	11	15		
40-16A2	40	16	6.350	1.5x2	3059	7486	118	86	128	106	15	11	17.5	11	15		
40-16B1	40	16	6.350	2.5x1	2660	6363	102	86	128	106	15	11	17.5	11	15		
50-6B3	50	6	3.969	2.5x3	3954	15048	93	84	118	100	16	9	14	8.5	15		
50-6C2	50	6	3.969	3.5x2	3726	14045	80	84	118	100	18	9	14	8.5	15		
50-12B2	50	12	7.938	2.5x2	7247	20315	123	100	152	125	22	13	20	13	20		
50-20A2	50	20	6.350	1.5x2	3436	9597	114	94	135	114	18	11	17.5	11	15		
63-10B2	63	10	6.350	2.5x2	5873	20135	130	110	154	130	22	11	17.5	11	15		
63-10B3	63	10	6.350	2.5x3	8324	30202	137	110	152	130	20	11	17.5	11	15		
63-10C2	63	10	6.350	3.5x2	7868	28291	128	110	152	130	20	11	17.5	11	15		
63-20B2	63	20	9.525	2.5x2	13494	42233	176	124	172	147	22	13	20	13	20		
80-10B3	80	10	6.350	2.5x3	9189	38525	137	130	176	152	22	13	20	13	20		
80-10B4	80	10	6.350	2.5x4	11768	51366	169	130	178	152	22	13	20	13	20		
80-12B3	80	12	7.144	2.5x3	10811	43246	159	136	185	159	22	13	20	13	20		
80-16B3	80	16	9.525	2.5x3	21186	80675	204	145	192	166	28	13	20	13	25		
80-20B2	80	20	9.525	2.5x2	14976	53774	185	144	210	174	28	18	26	17.5	25		

**R S V TYPE**

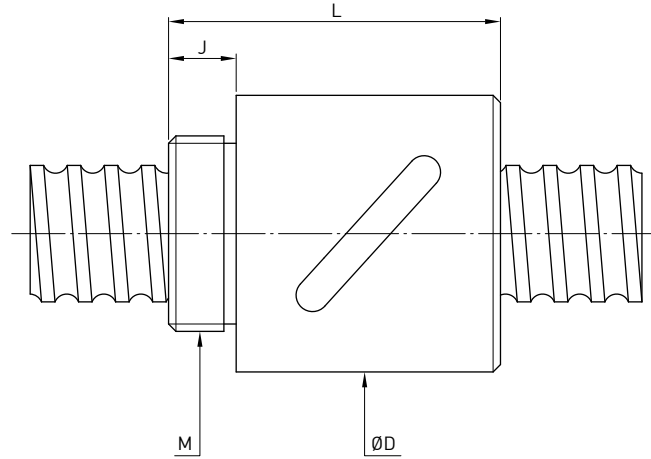
◀ Standard Product



Model	Size		Ball Dia.	Circuits	Dynamic Load C ( kgf )	Static Load Co ( kgf )	Nut		Mounting Thread	Mounting Thread Length	Return Tube Width	Return Tube Height
	Nominal Dia.	Lead					L	D				
8-2.5B1	8	2.5	2.000	2.5x1	218	317	28	18	M18x1P	10	15	15
10-2.5B1	10	2.5	2.000	2.5x1	252	405	30	20	M18x1P	10	17	17
10-4B1	10	4	2.381	2.5x1	305	466	32	23	M22x1P	10	20	20
12-4B1	12	4	2.381	2.5x1	344	574	32	25	M24x1P	10	22	21
16-5B1	16	5	3.175	2.5x1	679	1226	40	31	M28x1.5P	10	23	25
16-5.08B1	16	5.08	3.175	2.5x1	678	1226	45	30	M25x1.5P	13	24	21
16-5.08C1	16	5.08	3.175	3.5x1	905	1717	45	30	M25x1.5P	13	24	21
20-5C1	20	5	3.175	3.5x1	1001	2149	45	35	M32x1.5P	12	27	22
25-5B2	25	5	3.175	2.5x2	1534	3975	58	40	M38x1.5P	16	31	25
25-10B2	25	10	4.763	2.5x2	2663	6123	94	45	M38x1.5P	16	38	32
32-5B2	32	5	3.175	2.5x2	1702	5098	60	54	M50x2P	18	38	29
32-10B2	32	10	6.350	2.5x2	4379	10345	95	58	M52x2P	18	44	36
40-10B2	40	10	6.350	2.5x2	4812	12732	102	65	M60x2P	25	52	41
50-10C2	50	10	6.350	3.5x2	7146	22477	130	80	M75x2P	30	62	46
63-10C2	63	10	6.350	3.5x2	7869	28290	132	95	M90x2P	40	74	52
63-12C3	63	12	7.938	3.5x3	16828	58535	205	102	M95x3P	35	75	59

**R S B TYPE**

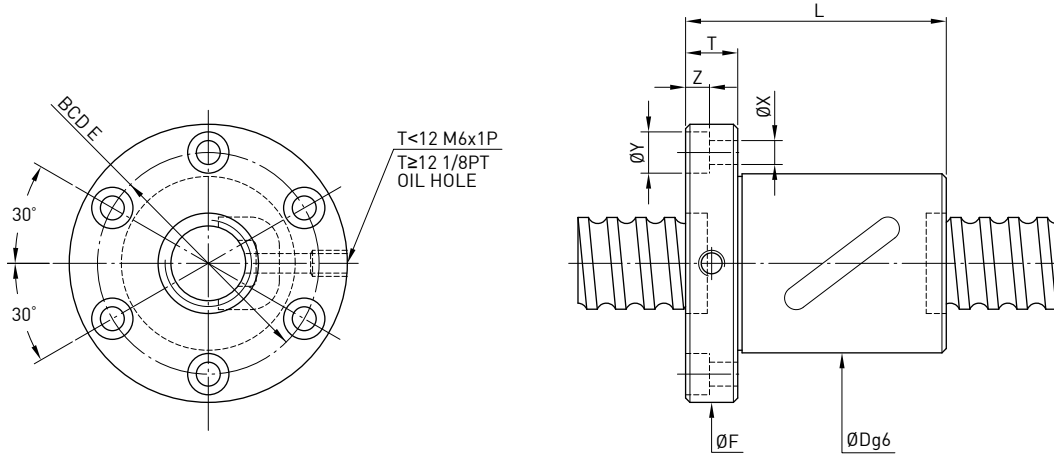
◀ Standard Product



Model	Size		Ball Dia.	Circuits	Dynamic Load C ( kgf )	Static Load Co ( kgf )	Nut		Mounting Thread M	Mounting Thread Length J
	Nominal Dia.	Lead					L	D		
8-2.5B1	8	2.5	2.000	2.5x1	218	317	24	22	M18x1P	7.5
10-2.5B1	10	2.5	2.000	2.5x1	252	405	24	24	M20x1P	7.5
10-4B1	10	4	2.381	2.5x1	305	466	34	26	M22x1P	10
12-4B1	12	4	2.381	2.5x1	344	574	34	25.5	M20x1P	10
12-5B1	12	5	2.000	2.5x1	275	481	38	26	M20x1P	8
16-5B1	16	5	3.175	2.5x1	678	1226	42	36	M30x1.5P	12
16-10B1	16	10	3.175	2.5x1	667	1194	57	36	M30x1.5P	12
20-5B1	20	5	3.175	2.5x1	746	1526	45	38	M35x1.5P	15
20-5C1	20	5	3.175	3.5x1	1001	2149	54	40	M36x1.5P	14
20-10B1	20	10	4.763	2.5x1	1280	2314	60	52	M40x1.5P	15
25-5B2	25	5	3.175	2.5x2	1534	3975	69	46	M42x1.5P	19
32-5B2	32	5	3.175	2.5x2	1702	5098	69	54	M50x2P	19
32-10B2	32	10	6.350	2.5x2	4384	10345	105	68	M62x2P	19
40-5B2	40	5	3.175	2.5x2	1859	6354	62	66	M62x2P	19
40-10B2	40	10	6.350	2.5x2	4812	12732	110	76	M70x2P	24
50-5B2	50	5	3.175	2.5x2	2004	7941	70	79	M70x2P	24
50-10C2	50	10	6.350	3.5x2	7145	22477	135	88	M82x2P	29
63-10C2	63	10	6.350	3.5x2	7868	28291	135	104	M95x2P	29

**F S B TYPE**

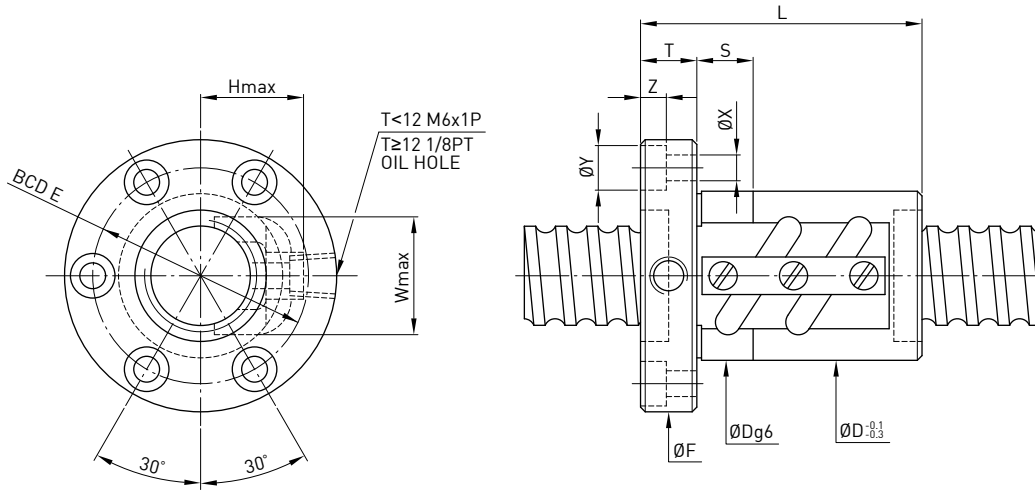
◀ Standard Product



Model	Size		Ball Dia.	Circuits	Dynamic Load C ( kgf )	Static Load Co ( kgf )	Nut		Flange					
	Nominal Dia.	Lead					L	D	F	BCD-E	T	Bolt		
											X	Y	Z	
8-2.5B1	8	2.5	2.000	2.5x1	218	317	34	22	43	31	8	5.5	9.5	5.5
10-2.5B1	10	2.5	2.000	2.5x1	252	405	34	24	46	34	8	5.5	9.5	5.5
10-4B1	10	4	2.381	2.5x1	304	466	41	26	49	37	10	5.5	9.5	5.5
12-4B1	12	4	2.381	2.5x1	344	574	41	28	51	39	10	5.5	9.5	5.5
12-4C1	12	4	2.381	3.5x1	459	803	44	30	50	40	10	4.5	8	4.5
14-4C1	14	4	2.381	3.5x1	498	943	40	31	50	40	10	4.5	8	4.5
14-5B1	14	5	3.175	2.5x1	636	1095	40	32	50	40	10	4.5	8	4.5
16-4B1	16	4	2.381	2.5x1	390	744	41	35	56	43	10	5.5	9.5	5.5
16-5B1	16	5	3.175	2.5x1	679	1226	43	36	60	47	10	5.5	9.5	5.5
16-10B1	16	10	3.175	2.5x1	667	1194	52	36	60	47	12	6.6	11	6.5
20-4C1	20	4	2.381	3.5x1	582	1329	40	40	60	50	10	4.5	8	4.5
20-5B1	20	5	3.175	2.5x1	745	1526	40	40	60	50	10	4.5	8	4.5
20-5C1	20	5	3.175	3.5x1	1001	2149	50	40	64	51	12	5.5	9.5	5.5
20-10B1	20	10	4.763	2.5x1	1280	2314	61	52	82	67	12	6.6	11	6.5
25-5B1	25	5	3.175	2.5x1	845	1987	40	43	67	55	10	5.5	9.5	5.5
25-5B2	25	5	3.175	2.5x2	1534	3975	60	46	70	58	12	5.5	9.5	5.5
25-10B2	25	10	4.763	2.5x2	2652	5966	98	60	96	78	15	5.5	9.5	5.5
32-5B2	32	5	3.175	2.5x2	1702	5098	60	54	80	67	12	6.6	11	6.5
32-10B1	32	10	6.350	2.5x1	2416	5172	68	68	102	84	16	9	14	8.5
32-10B2	32	10	6.350	2.5x2	4379	10345	98	68	102	84	16	9	14	8.5
40-10B2	40	10	6.350	2.5x2	4812	12732	102	76	117	96	18	11	17.5	11
50-10C2	50	10	6.350	3.5x2	7146	22477	126	88	129	108	18	11	17.5	11
63-10C2	63	10	6.350	3.5x2	7869	28290	128	104	146	124	20	11	17.5	11

**F S V TYPE**

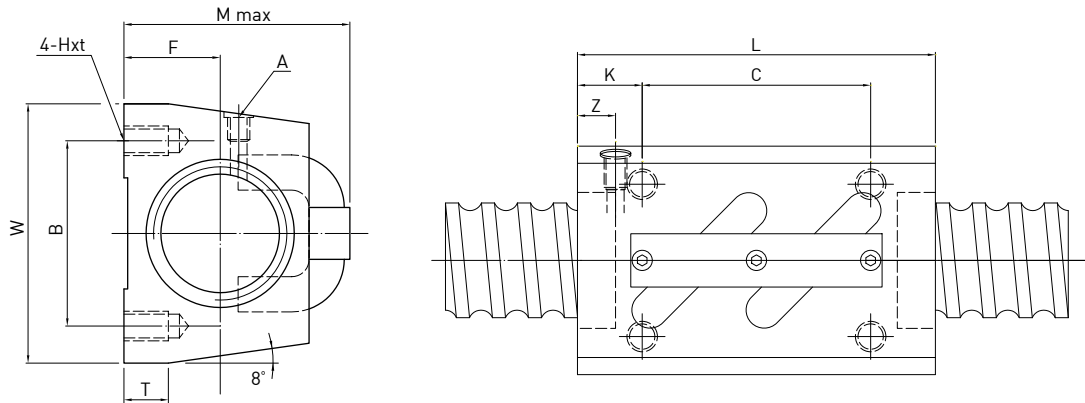
◀ Standard Product



Model	Size		Ball Dia.	Circuits	Dynamic Load C ( kgf )	Static Load Co ( kgf )	Nut		Flange		Return Tube			Bolt		Fit	
	Nominal Dia.	Lead					L	D	F	BCD-E	T	X	Y	Z	W		H
8-2.5B1	8	2.5	2.000	2.5x1	218	317	34	18	41	29	8	5.5	9.5	5.5	15	15	8
10-2.5B1	10	2.5	2.000	2.5x1	252	405	34	20	43	31	8	5.5	9.5	5.5	17	17	8
10-4B1	10	4	2.381	2.5x1	304	466	41	23	46	34	10	5.5	9.5	5.5	20	20	10
12-4B1	12	4	2.381	2.5x1	344	574	41	25	48	36	10	5.5	9.5	5.5	22	21	12
16-5B1	16	5	3.175	2.5x1	679	1226	43	31	55	42	10	5.5	9.5	5.5	23	25	12
16-10B1	16	10	3.175	2.5x1	667	1194	54	30	53	41	10	5.5	9.5	5.5	23	22	12
20-5B1	20	5	3.175	1.5x1	746	1526	46	34	58	46	12	5.5	9.5	5.5	28	25	12
20-5B2	20	5	3.175	2.5x2	1353	3052	60	34	58	46	12	5.5	9.5	5.5	28	25	12
20-5C1	20	5	3.175	3.5x1	1001	2149	50	35	59	46	12	5.5	9.5	5.5	27	22	12
25-5B2	25	5	3.175	2.5x2	1534	3975	60	40	64	52	12	5.5	9.5	5.5	31	25	12
32-5B2	32	5	6.350	2.5x2	1702	5098	60	54	80	67	12	6.6	11	6.5	38	29	12
32-10B2	32	10	6.350	2.5x2	4379	10345	98	58	92	74	16	9	14	8.5	44	36	15
32-20B1	32	20	6.350	2.5x1	2415	5173	100	54	88	70	15	9	14	8.5	43	35	15
40-5B2	40	5	3.175	2.5x2	1859	6354	65	58	92	72	16	9	14	8.5	46	34	15
40-10B2	40	10	6.350	2.5x2	4812	12732	102	65	106	85	18	11	17.5	11	52	41	15
40-10C2	40	10	6.350	3.5x2	6473	17975	120	65	114	90	20	11	17.5	11	53	42	15
50-10C2	50	10	6.350	3.5x2	7146	22477	126	80	121	100	18	11	17.5	11	62	46	20
63-10C2	63	10	6.350	3.5x2	7869	28290	128	95	137	115	20	11	17.5	11	74	52	20
63-16B2	63	16	9.525	2.5x2	13676	43030	153	100	150	123	22	13	20	13	78	62	20
80-10B3	80	10	6.350	2.5x3	9189	38525	139	115	163	137	22	14	20	13	90	64	20
80-20B2	80	20	9.525	2.5x2	14976	53774	225	125	190	152	28	18	26	17.5	95	75	20
80-20B3	80	20	9.525	2.5x3	21224	80661	245	125	190	152	28	18	26	17.5	95	72	20

**S S V TYPE**

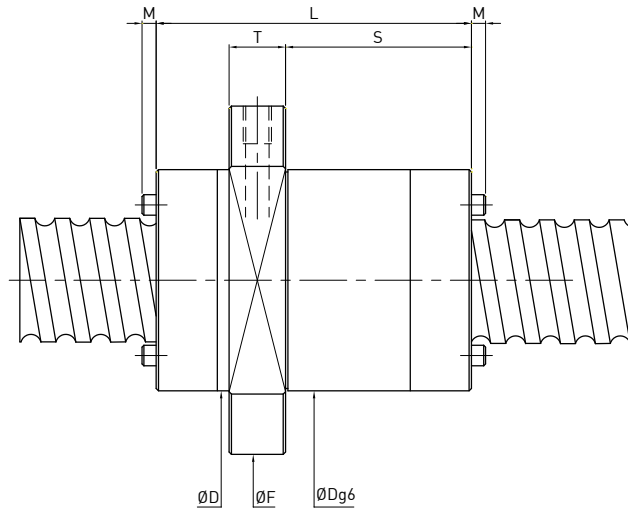
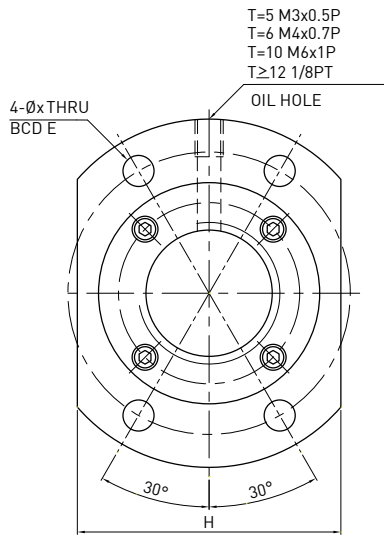
◀ Standard Product



Model	Size		Ball Dia.	Circuits	Dynamic Load C [ kgf ]	Static Load Co [ kgf ]	W	Hxt	F	L	B	C	K	T	A	M (max)	Z
	Nominal Dia.	Lead															
14-4B1	14	4	2.381	2.5x1	376	682	34	M4x7	13	35	26	22	6.5	6	M6	30	6
14-4C1	14	4	2.381	3.5x1	498	943	34	M4x7	13	35	26	22	6.5	6	M6	30	6
14-5B1	14	5	3.175	2.5x1	636	1095	34	M4x7	13	35	26	22	6.5	6	M6	31	6
16-5B1	16	5	3.175	2.5x1	679	1226	42	M5x8	16	36	32	22	7	21.5	M6	36	6
20-5B1	20	5	3.175	2.5x1	745	1526	48	M6x10	17	35	35	22	6.5	9	M6	39	5
20-10B1	20	10	4.763	2.5x1	1280	2314	48	M6x10	18	58	35	35	11.5	9	M6	46	10
25-5B1	25	5	3.175	2.5x1	845	1987	60	M8x12	20	35	40	22	6.5	9.5	M6	45	7
25-10B2	25	10	6.350	2.5x2	3816	7968	60	M8x12	23	94	40	60	17	10	M6	54	10
28-6B1	28	6	3.969	2.5x1	1203	2796	60	M8x12	22	42	40	18	12	10	M6	50	8
28-6B2	28	6	3.969	2.5x2	2184	5592	60	M8x12	22	67	40	40	13.5	10	M6	50	8
32-10B1	32	10	6.350	2.5x1	2413	5172	70	M8x12	26	64	50	45	9.5	12	M6	62	10
32-10B2	32	10	6.350	2.5x2	4379	10345	70	M8x12	26	94	50	60	17	12	M6	67	10
36-10B2	36	10	6.350	2.5x2	4592	11403	86	M10x16	29	96	60	60	18	17	M6	67	11
45-12B2	45	12	7.144	2.5x2	5963	16110	100	M12x20	36	115	75	75	20	20.5	M6	80	13

**D F S H TYPE**

◀ High Lead

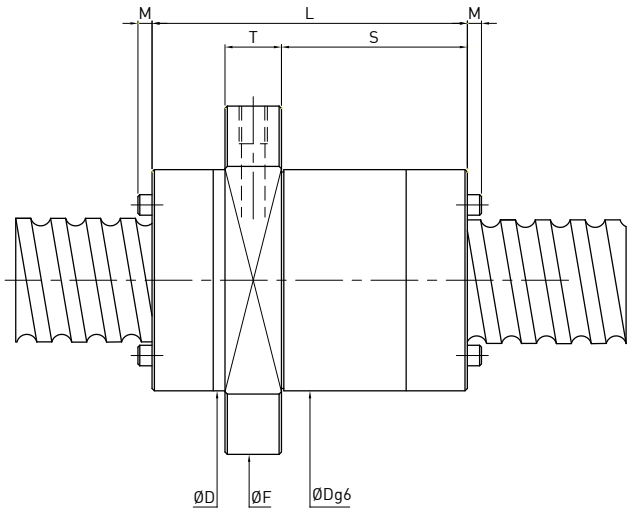
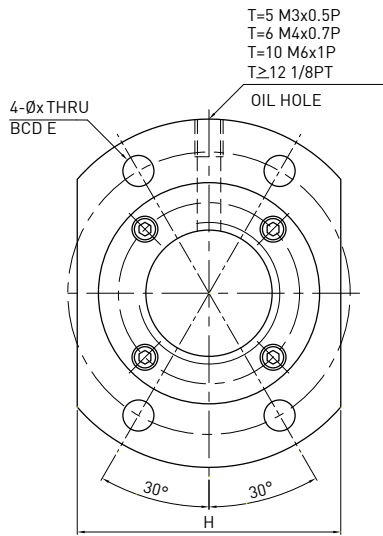


Model	Size		Ball Dia.	Circuits	Dynamic Load C [ kgf ]	Static Load Co [ kgf ]	Nut		Flange			Bolt X	Fit		
	Nominal Dia.	Lead					D	L	F	T	BCD-E		H	S	M
10-20V2	10	20	1.5	0.8x2	100	240	20	23	37	5	29	22	4.5	13	0
12-12S2	12	12	2.381	1.8x2	460	1030	26	30	44	6	35	28	4.5	15	0
15-10U2	15	10	3.175	2.8x2	1090	2570	34	44	57	10	45	40	5.5	24	0
15-30S2	15	30	3.175	1.8x2	700	1720	34	63	51	10	42	36	4.5	43	0
16-16S2	16	16	3.175	1.8x2	780	1830	32	38	53	10	42	38	4.5	21.5	0
16-16S2	16	16	3.175	1.8x2	780	1830	32	48	53	10	42	38	4.5	26	0
16-16S2	16	16	3.175	1.8x2	780	1830	33	48	58	10	45	38	6.6	26	0
16-32V2	16	32	3.175	0.8x2	340	760	34	34	55	10	45	36	5.5	13.5	0
20-20S2	20	20	3.175	1.8x2	870	2290	38	45	62	10	50	46	5.5	23.6	0
20-20S2	20	20	3.175	1.8x2	870	2290	38	58	62	10	50	46	5.5	32.5	3
20-40V2	20	40	3.175	0.8x2	390	980	35	41	58	10	48	40	5.5	20	0
25-20S2	25	20	3.969	1.8x2	1280	3470	47	53	74	12	60	49	6.6	30	0
25-25S2	25	25	3.969	1.8x2	1300	3600	47	55	74	12	60	56	6.6	35	0
25-25S2	25	25	3.969	1.8x2	1300	3600	47	67	74	12	60	56	6.6	39.5	3
32-32S2	32	32	4.763	1.8x2	1840	5450	58	70	92	12	74	60	9	42	0
32-32S2	32	32	4.763	1.8x2	1840	5450	58	85	92	15	74	68	9	48	0
32-64V2	32	64	4.763	0.8x2	860	2460	58	62	89	15	71	58	9	37	0
38-40S2	38	40	3.969	1.8x2	1530	5360	63	85	93	14	78	70	9	64	0
40-40S2	40	40	6.350	1.8x2	3030	9220	72	102	114	17	93	84	11	60	0
50-50S2	50	50	7.938	1.8x2	4520	14440	90	107	135	20	112	92	14	66.5	0
50-50S2	50	50	7.938	1.8x2	4520	14440	90	125	135	20	112	104	14	83.5	0



**Q F S H TYPE**

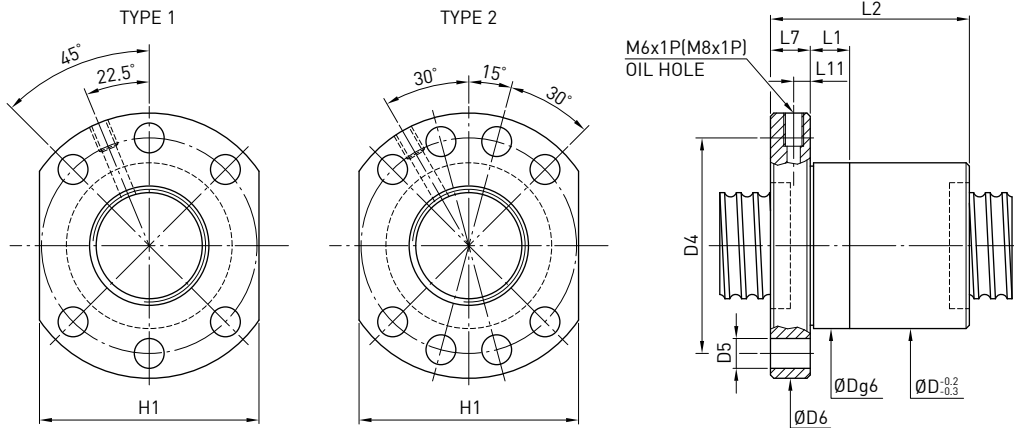
◀ High Lead



Model	Size		Ball Dia.	Circuits	Dynamic Load C [ kgf ]	Static Load Co [ kgf ]	Nut		Flange				Bolt X	Fit	
	Nominal Dia.	Lead					D	L	F	T	BCD-E	H		S	M
10-20V4	10	20	1.5	0.8x4	190	480	20	23	37	5	29	22	4.5	13	0
12-12S4	12	12	2.381	1.8x4	840	2060	26	30	44	6	35	28	4.5	15	0
15-30S4	15	30	3.175	1.8x4	1280	3450	34	63	51	10	42	36	4.5	43	0
16-16S4	16	16	3.175	1.8x4	1420	3670	32	38	53	10	42	38	4.5	21.5	0
16-16S4	16	16	3.175	1.8x4	1420	3670	32	48	53	10	42	38	4.5	26	0
16-16S4	16	16	3.175	1.8x4	1420	3670	33	48	58	10	45	38	6.6	26	0
16-32V4	16	32	3.175	0.8x4	620	1520	34	34	55	10	45	36	5.5	13.5	0
20-20S4	20	20	3.175	1.8x4	1580	4590	38	45	62	10	50	46	5.5	23.6	0
20-20S4	20	20	3.175	1.8x4	1580	4590	38	58	62	10	50	46	5.5	32.5	3
20-40V4	20	40	3.175	0.8x4	710	1970	35	41	58	10	48	40	5.5	20	0
25-25S4	25	25	3.969	1.8x4	2360	7200	47	55	74	12	60	56	6.6	35	0
25-25S4	25	25	3.969	1.8x4	2360	7200	47	67	74	12	60	56	6.6	39.5	3
32-32S4	32	32	4.763	1.8x4	3340	10900	58	70	92	12	74	60	9	42	0
32-32S4	32	32	4.763	1.8x4	3340	10900	58	85	92	15	74	68	9	48	0
32-64V4	32	64	4.763	0.8x4	1560	4930	58	62	89	15	71	58	9	37	0
38-40S4	38	40	3.969	1.8x4	2790	10720	63	85	93	14	78	70	9	64	0
40-40S4	40	40	6.350	1.8x4	5500	18450	72	102	114	17	93	84	11	60	0
50-50S4	50	50	7.938	1.8x4	8220	28880	90	107	135	20	112	92	14	66.5	0
50-50S4	50	50	7.938	1.8x4	8220	28880	90	125	135	20	112	104	14	83.5	0

## 7.5 Dimensions for DIN Rolled Ballscrews

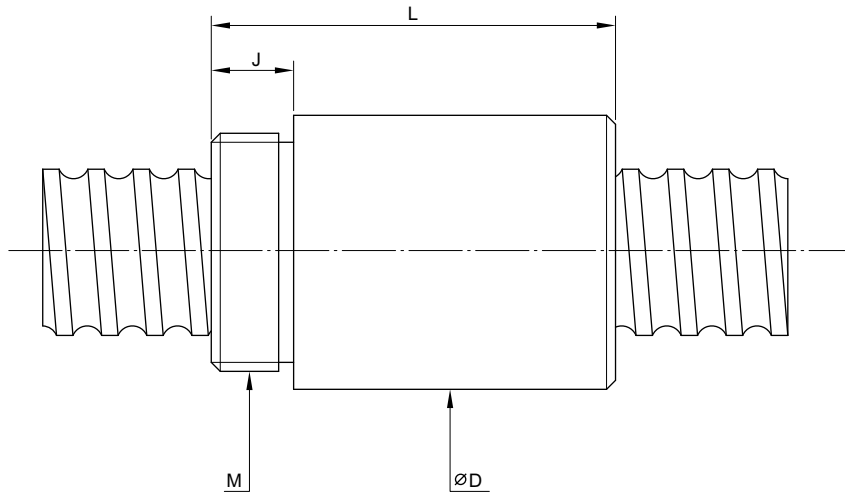
**F S C / F S I** TYPE (DIN 69051 part 5 form B) ◀ Stock



Model	Size		Ball Dia.	Circuits	Dynamic Load 1x10 <sup>6</sup> revs C (kgf)	Static Load Co (kgf)	Nut		Flange										PCD
	Nominal Dia.	Lead					L2	D	D4	D5	D6	H1	L7	TYPE	L1	L11	M-Oil Hold		
15-5K3	15	5	3	3	990	1580	38	28	38	5.5	48	40	10	1	10	5	M6×1P	14.93	
16-5T3	16	5	3.175	3	1000	2000	40	28	38	5.5	48	40	10	1	10	5	M6×1P	16.175	
20-5K3	20	5	3.175	3	1280	2410	36	36	47	6.6	58	44	10	1	10	5	M6×1P	20.2	
20-5K4	20	5	3.175	4	1670	3270	40	36	47	6.6	58	44	10	1	10	5	M6×1P	20.2	
25-5K3	25	5	3.175	3	1420	3050	38	40	51	6.6	62	48	10	1	10	5	M6×1P	25.57	
25-5K4	25	5	3.175	4	1850	4150	43	40	51	6.6	62	48	10	1	10	5	M6×1P	25.57	
25-10K5	25	10	3.175	5	2260	5200	70	40	51	6.6	62	48	10	1	10	5	M6×1P	25.1	
32-5K4	32	5	3.175	4	2070	5360	38	50	65	9	80	62	12	1	10	6	M6×1P	32.4	
32-5K6	32	5	3.175	6	2980	8190	48	50	65	9	80	62	12	1	10	6	M6×1P	32.4	
32-10T3	32	10	6.35	3	3650	8660	74	50	65	9	80	62	16	1	16	6	M6×1P	34.25	
32-10T4	32	10	6.35	4	4680	11550	85	50	65	9	80	62	16	1	16	6	M6×1P	34.26	
32-10K5	32	10	3.969	5	3390	8160	73	50	65	9	80	62	12	1	10	6	M6×1P	32.62	
32-10K6	32	10	3.969	6	3990	9860	83	50	65	9	80	62	12	1	10	6	M6×1P	32.62	
40-5K4	40	5	3.175	4	2240	6590	40	63	78	9	93	70	14	2	10	7	M8×1P	40.03	
40-5K6	40	5	3.175	6	3220	10060	50	63	78	9	93	70	14	2	10	7	M8×1P	40.03	
38-10K3	38	10	6.35	3	4350	9140	60	63	78	9	93	70	14	2	20	7	M8×1P	39.3	
40-10T3	40	10	6.35	3	4030	10680	74	63	78	9	93	70	16	2	16	7	M8×1P	41.85	
38-10K4	38	10	6.35	4	5660	12410	70	63	78	9	93	70	14	2	20	7	M8×1P	39.3	
40-10T4	40	10	6.35	4	5170	14240	87	63	78	9	93	70	16	2	16	7	M8×1P	41.85	
50-5K4	50	5	3.175	4	2450	8330	40	75	93	11	110	85	16	2	10	8	M8×1P	50.05	
50-5K6	50	5	3.175	6	3530	12720	50	75	93	11	110	85	16	2	10	8	M8×1P	50.05	
50-10K3	50	10	6.35	3	4960	12240	60	75	93	11	110	85	16	2	20	8	M8×1P	51.93	
50-10K4	50	10	6.35	4	6450	16610	70	75	93	11	110	85	16	2	20	8	M8×1P	51.93	
50-10K6	50	10	6.35	6	9280	25350	90	75	93	11	110	85	16	2	20	8	M8×1P	51.93	
63-10K6	63	10	6.35	6	10180	31750	94	90	108	11	125	95	18	2	10	9	M8×1P	64.534	

**R S I** TYPE (with V-thread)

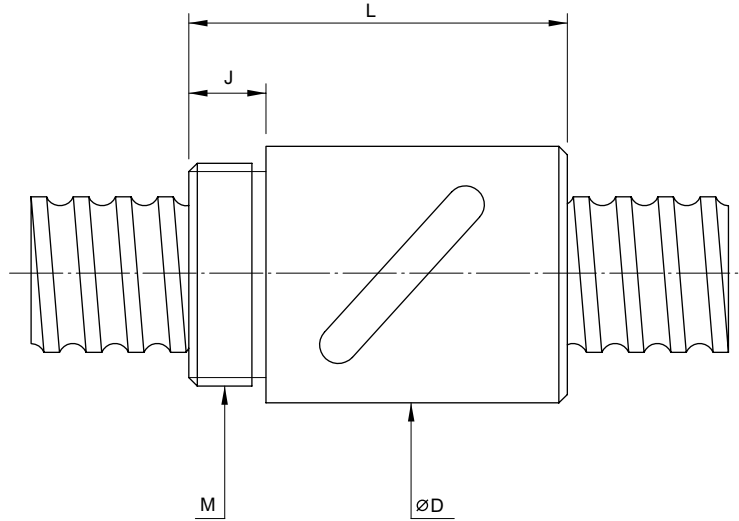
◀ Stock



Model	Size		Ball Dia.	Circuits	Dynamic Load 1x10 <sup>6</sup> revs C ( kgf )	Static Load Co ( kgf )	L	D	M	J
	Nominal Dia.	Lead								
8-2.5T2	8	2.5	2.000	2	133	178	23.5	17.5	M15x1P	7.5
10-2.5T2	10			2	178	263	25	19.5	M17x1P	7.5
10-4T2	10	4	2.381	2	198	282	32	24	M22x1P	10

**R S B TYPE** (with V-thread)

◀ Stock



Model	Size		Ball Dia.	Circuits	Dynamic Load 1x10 <sup>6</sup> revs C ( kgf )	Static Load Co ( kgf )	L	D	M	J
	Nominal Dia.	Lead								
12-4B1	12	4	2.381	2.5x1	344	574	34	25.5	M20x1P	10

## 8. Composite Ball Screw

### 8.1 E2 Self-lubricant



#### • Features:

##### • Cost savings:

The E2 series saves cost by eliminating piping joint systems, change and waste disposal, and by reducing oil purchases.

##### • Greatly extends the maintenance period:

The E2 series will supply proper lubrication for long periods of time extending the maintenance period.

##### • Easy maintenance:

The special construction of the E2 design requires no tools to replace the oil cartridge. There is no disassembly required when adding the E2 option.

##### • Ideal lubrication position:

The lubrication point is located inside the ball nut allowing for the lubrication to be firmly applied onto the ball tracks.

##### • Effortless and flexible installation:

The lubrication performs properly in every direction so there are no restrictions when installing the E2.

##### • Clean and environmentally friendly:

Prevents oil leakage, making the E2 the ideal solution for clean room environments.

##### • Interchangeable oil selection:

The replaceable oil cartridge can be refilled with any approved lubrication oil.

##### • Applications for special environments:

The lubrication oil can be combined with grease for better results, especially in dusty, dirty, or wet environments.

#### • Design Structure:

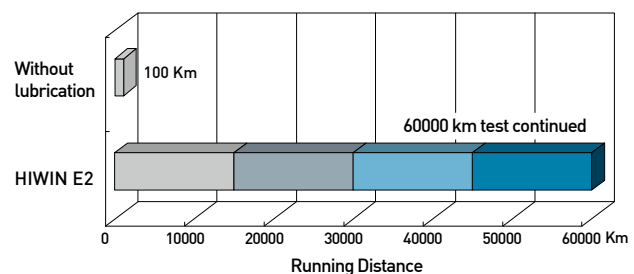
Developed by HIWIN for the purpose of extending the service cycle of a ball screw, this self-lubricant ball screw with a removable oil kit is easy to remove and refill without the need for uninstalling the ball screw from the machine, thus saving the time for service and maintenance.

#### • Performance:

The E2 series will extend the maintenance period by supplying proper lubrication for long periods of time.

Test condition :	
Specification	R40-40K2-FSC
Oil	Mobil SHC 636 [50C.C.]
Speed	3000 rpm
Stroke	1000mm

E2 Performance Test



\* Note : above test with no grease added

#### • Lubricant oil characteristics:

The E2 self-lubricant cartridge is equipped with synthetic hydrocarbon based oil. The lubricant oil has a viscosity grade of ISO VG680.

- The E2 is compatible with mineral, hydrocarbon, and ester based greases.
- The E2 can accept synthetic oils with stable characteristics.
- A high viscosity grade will work well in conditions where there are high and low temperatures.
- The low fluid draft factor prevents excessive power consumption.
- Anti-corrosion and rust.
  - ◇ A compatible lubricate oil with the same viscosity grade can also be used in the replaceable cartridge.

• **Application:**

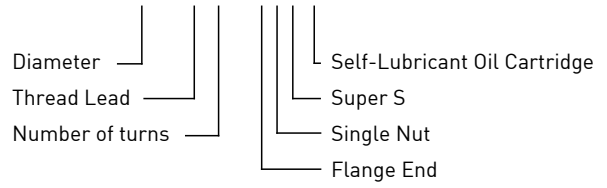
- Machine tools
- Industrial machinery : printing machine, paper-processing machine, automatic machine, textile machine, cutting and grinding machines, etc.
- Electronic machinery : robots, measuring equipment, X-Y tables, etc.
- Miscellaneous: medical equipment, factory automation equipment, etc.

• **Temperature range:**

The ideal E2 temperature range is from -10°C to 60°C, please notify Hiwin engineers if the temperature requirement is out of this range.

• **Specification number:**

Example: R40 - 20K3 - FSCE2 - 1200 - 1600 - 0.008



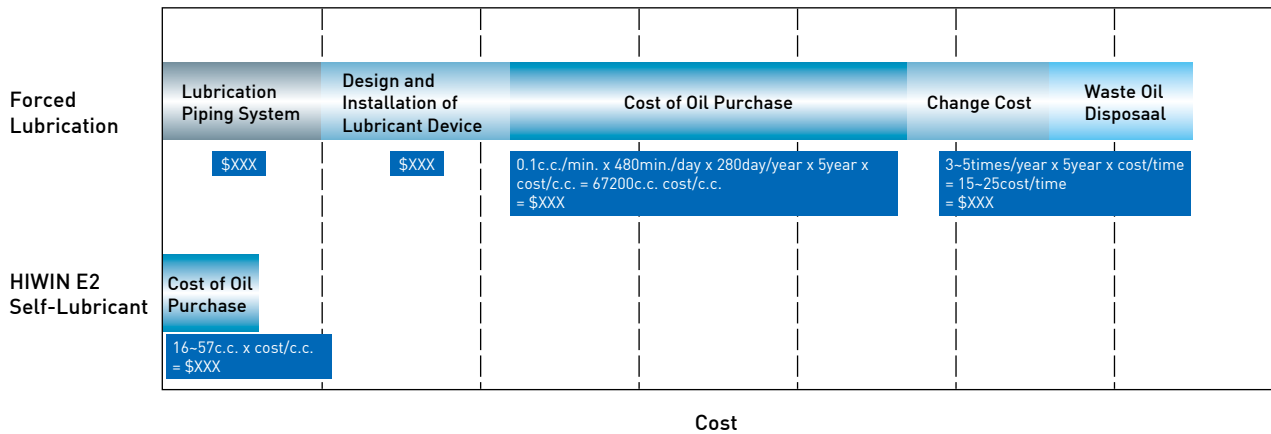
• **Specification:**

Nut type : FSV, FDV, FSW, FDW, PFDW, OFSW, Super S  
Please contact HIWIN engineers for other specification needs.

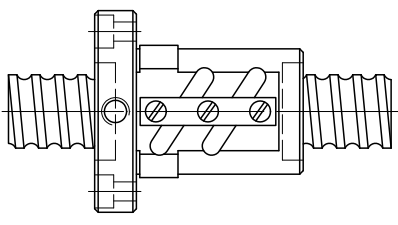
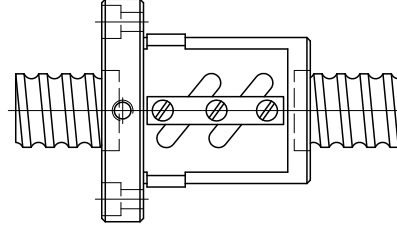
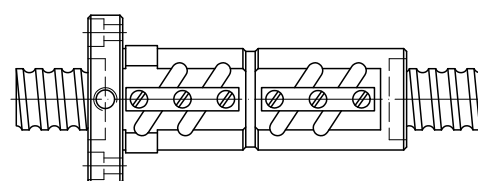
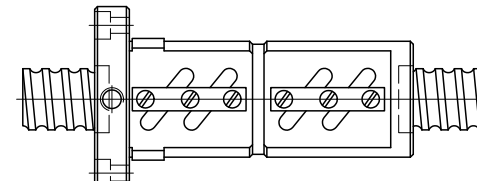
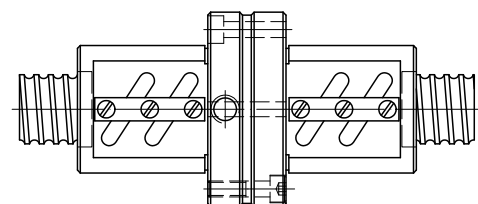
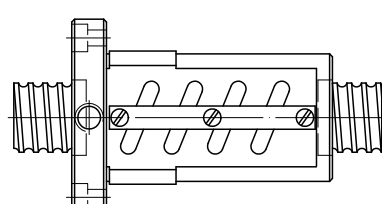
In order to get good lubrication efficiency; please notify HIWIN engineers of the ballscrew installation direction.

• **Cost saving:**

The E2 series saves cost by eliminating piping joint systems, change and waste disposal, and by reducing oil purchases.

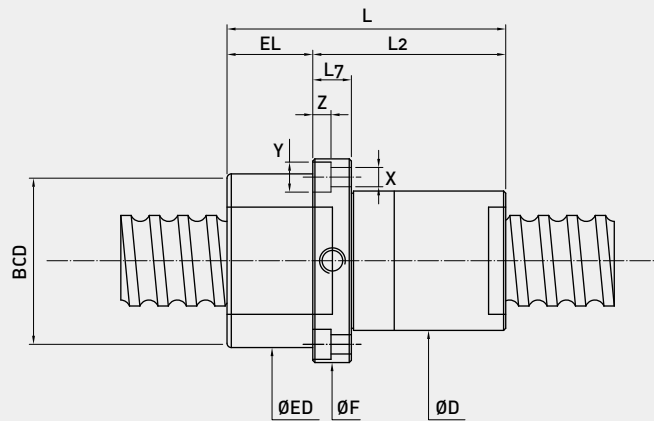


**HIWIN E2 Precision Ground Ballscrews**

General Type	
<p><b>FSV</b></p>  <p>(F)Flange end, (S)single nut, (V)tube above nut diameter</p>	<p><b>FSW</b></p>  <p>(F)Flange end, (S)single nut, (W)tube within nut diameter</p>
<p><b>FDV</b></p>  <p>(F)Flange end, (D)double nut, (V)tube above nut diameter</p>	<p><b>FDW</b></p>  <p>(F)Flange end, (D)double nut, (W)tube within nut diameter</p>
<p><b>PFDW</b></p>  <p>(PF)Flange to flange, (D)double nut, (W)tube within nut diameter</p>	<p><b>OFSW</b></p>  <p>(O)Offset pitch preload, (F)flange end, (S)single nut, (W)tube within nut diameter</p>

**Dimension table for E2**

(Nut diameter is smaller than the oil cartridge)



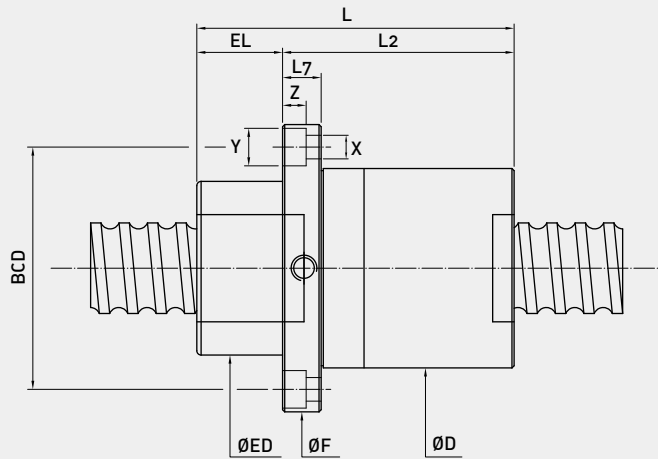
Please remove oil cartridge when installing the nut

Model	Specification			Nut Size									E2 Size		
	Nominal Dia.	Lead	Ball Dia.	D	L2	F	L7	BCD	X	Y	Z	EL	ED	L	
20-10K3	20	10	3.175	36	47	62	12	47	6.6	11	6.5	40	49	87	
20-20K2	20	20	3.175	36	56	62	12	47	6.6	11	6.5	40	49	96	
25-10K3	25	10	3.175	40	50	66	12	51	6.6	11	6.5	40	49	90	
25-25K2	25	25	3.175	40	69	66	12	51	6.6	11	6.5	40	49	109	
25-12K4	25	12	3.969	45	67	69	12	54	6.6	11	6.5	40	49	107	
32-5K4	32	5	3.175	48	38	77	12	59	9	14	8.5	40	62	78	
32-8K5	32	8	3.969	50	59	83	12	65	9	14	8.5	40	62	99	
32-10K5	32	10	3.969	50	73	83	12	65	9	14	8.5	40	62	113	
32-20K3	32	20	3.969	50	87	83	12	65	9	14	8.5	40	62	127	
32-32K2	32	32	3.969	50	87	83	12	65	9	14	8.5	40	62	127	
32-10K5	32	10	4.763	56	79	89	14	71	9	14	8.5	40	62	119	
32-12K5	32	12	4.763	56	88	89	14	71	9	14	8.5	40	62	128	
32-10K5	32	10	6.35	62	77	95	18	77	9	14	8.5	36	81	113	
32-12K5	32	12	6.35	62	87	95	18	77	9	14	8.5	36	81	123	
32-16K4	32	16	6.35	62	92	95	18	77	9	14	8.5	36	81	128	
32-20K3	32	20	6.35	62	87	95	18	77	9	14	8.5	36	81	123	
36-8K5	36	8	4.763	59	64	92	14	74	9	14	8.5	36	81	100	
36-10K5	36	10	6.35	66	80	99	18	81	9	14	8.5	36	81	116	
36-12K5	36	12	6.35	66	87	99	18	81	9	14	8.5	36	81	123	
36-16K5	36	16	6.35	66	109	99	18	81	9	14	8.5	36	81	145	
36-20K4	36	20	6.35	61	108	94	18	76	9	14	8.5	36	81	144	
36-36K2	36	36	6.35	61	95	94	18	76	9	14	8.5	36	81	131	
38-8K5	38	8	4.763	61	64	94	14	76	9	14	8.5	36	81	100	
38-16K5	38	16	6.35	63	108	96	18	78	9	14	8.5	36	81	144	
38-20K4	38	20	6.35	63	108	96	18	78	9	14	8.5	36	81	144	
38-25K4	38	25	6.35	63	127	96	18	78	9	14	8.5	36	81	162	
38-40K2	38	40	6.35	63	103	96	18	78	9	14	8.5	36	81	137	
40-8K5	40	8	4.763	63	64	96	14	78	9	14	8.5	36	81	100	
40-10K5	40	10	6.35	70	83	103	18	85	9	14	8.5	36	81	119	
40-12K5	40	12	6.35	70	86	103	18	85	9	14	8.5	36	81	122	
40-16K5	40	16	6.35	70	108	103	18	85	9	14	8.5	36	81	144	
40-20K4	40	20	6.35	70	110	103	18	85	9	14	8.5	36	81	146	
40-25K4	40	25	6.35	65	127	98	18	80	9	14	8.5	36	81	163	
40-40K2	40	40	6.35	65	101	98	18	80	9	14	8.5	36	81	137	
45-10K5	45	10	6.35	75	78	115	18	93	11	17.5	11	36	92	114	
45-12K5	45	12	6.35	75	89	115	18	93	11	17.5	11	36	92	125	
45-16K5	45	16	6.35	75	108	115	18	93	11	17.5	11	36	92	144	
45-20K4	45	20	6.35	75	108	115	18	93	11	17.5	11	36	92	144	
45-25K4	45	25	6.35	70	129	110	18	88	11	17.5	11	36	92	165	
45-40K3	45	40	6.35	70	145	110	18	88	11	17.5	11	36	92	181	
50-10K5	50	10	6.35	82	80	122	18	100	11	17.5	11	36	92	116	
50-12K5	50	12	6.35	82	90	122	18	100	11	17.5	11	36	92	126	
50-16K5	50	16	6.35	82	109	122	18	100	11	17.5	11	36	92	145	
50-20K4	50	20	6.35	82	106	122	18	100	11	17.5	11	36	92	142	
50-25K4	50	25	6.35	75	129	115	18	93	11	17.5	11	36	92	165	
50-30K4	50	30	6.35	75	147	115	18	93	11	17.5	11	36	92	183	
50-40K3	50	40	6.35	75	145	115	18	93	11	17.5	11	36	92	181	
50-30K2	50	30	7.144	82	92	122	18	100	11	17.5	11	36	92	128	



**Dimension table for E2**

(Nut diameter is larger than the oil cartridge)



Model	Specification			Nut Size								E2 Size		
	Nominal Dia.	Lead	Ball Dia.	D	L2	F	L7	BCD	X	Y	Z	EL	ED	L
20-10K3	20	10	3.175	51	47	76	12	62	6.6	11	6.5	40	49	87
20-20K2	20	20	3.175	51	56	76	12	62	6.6	11	6.5	40	49	96
25-10K3	25	10	3.175	51	50	76	12	62	6.6	11	6.5	40	49	90
25-25K2	25	25	3.175	51	69	76	12	62	6.6	11	6.5	40	49	109
25-12K4	25	12	3.969	51	67	76	12	62	6.6	11	6.5	40	49	107
32-5K4	32	5	3.175	64	38	95	12	78	9	14	8.5	40	62	78
32-8K5	32	8	3.969	64	59	95	12	78	9	14	8.5	40	62	99
32-10K5	32	10	3.969	64	73	95	12	78	9	14	8.5	40	62	113
32-20K3	32	20	3.969	64	87	95	12	78	9	14	8.5	40	62	127
32-32K2	32	32	3.969	64	87	95	12	78	9	14	8.5	40	62	127
32-10K5	32	10	4.763	64	79	95	14	78	9	14	8.5	40	62	119
32-12K5	32	12	4.763	64	88	95	14	78	9	14	8.5	40	62	128
32-10K5	32	10	6.35	83	77	114	18	97	9	14	8.5	36	81	113
32-12K5	32	12	6.35	83	87	114	18	97	9	14	8.5	36	81	123
32-16K4	32	16	6.35	83	92	114	18	97	9	14	8.5	36	81	128
32-20K3	32	20	6.35	83	87	114	18	97	9	14	8.5	36	81	123
36-8K5	36	8	4.763	83	64	114	14	97	9	14	8.5	36	81	100
36-10K5	36	10	6.35	83	80	114	18	97	9	14	8.5	36	81	116
36-12K5	36	12	6.35	83	87	114	18	97	9	14	8.5	36	81	123
36-16K5	36	16	6.35	83	109	114	18	97	9	14	8.5	36	81	145
36-20K4	36	20	6.35	83	108	114	18	97	9	14	8.5	36	81	144
36-36K2	36	36	6.35	83	95	114	18	97	9	14	8.5	36	81	131
38-8K5	38	8	4.763	83	64	114	14	97	9	14	8.5	36	81	100
38-16K5	38	16	6.35	83	108	114	18	97	9	14	8.5	36	81	144
38-20K4	38	20	6.35	83	108	114	18	97	9	14	8.5	36	81	144
38-25K4	38	25	6.35	83	127	114	18	97	9	14	8.5	36	81	162
38-40K2	38	40	6.35	83	103	114	18	97	9	14	8.5	36	81	137
40-8K5	40	8	4.763	83	64	114	14	97	9	14	8.5	36	81	100
40-10K5	40	10	6.35	83	83	114	18	97	9	14	8.5	36	81	119
40-12K5	40	12	6.35	83	86	114	18	97	9	14	8.5	36	81	122
40-16K5	40	16	6.35	83	108	114	18	97	9	14	8.5	36	81	144
40-20K4	40	20	6.35	83	110	114	18	97	9	14	8.5	36	81	146
40-25K4	40	25	6.35	83	127	114	18	97	9	14	8.5	36	81	163
40-40K2	40	40	6.35	83	101	114	18	97	9	14	8.5	36	81	137
45-10K5	45	10	6.35	94	78	133	18	112	11	17.5	11	36	92	114
45-12K5	45	12	6.35	94	89	133	18	112	11	17.5	11	36	92	125
45-16K5	45	16	6.35	94	108	133	18	112	11	17.5	11	36	92	144
45-20K4	45	20	6.35	94	108	133	18	112	11	17.5	11	36	92	144
45-25K4	45	25	6.35	94	129	133	18	112	11	17.5	11	36	92	165
45-40K3	45	40	6.35	94	145	133	18	112	11	17.5	11	36	92	181
50-10K5	50	10	6.35	94	80	133	18	112	11	17.5	11	36	92	116
50-12K5	50	12	6.35	94	90	133	18	112	11	17.5	11	36	92	126
50-16K5	50	16	6.35	94	109	133	18	112	11	17.5	11	36	92	145
50-20K4	50	20	6.35	94	106	133	18	112	11	17.5	11	36	92	142
50-25K4	50	25	6.35	94	129	133	18	112	11	17.5	11	36	92	165
50-30K4	50	30	6.35	94	147	133	18	112	11	17.5	11	36	92	183
50-40K3	50	40	6.35	94	145	133	18	112	11	17.5	11	36	92	181
50-30K2	50	30	7.144	94	92	133	18	112	11	17.5	11	36	92	128

## 8.2 R1 Rotating Nut



• **Application:**

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

• **Features:**

**1. Compact and high positioning:**

A compact design using nut and support bearing as an integral unit. A 45-degree steel ball contact angle makes a better axial load. Zero backlash and higher stiffness construction provides high positioning.

**2. Simple installation:**

Simply installed by fixing the nut on the housing with bolts.

**3. Rapid feed:**

No inertial effect is produced by the integral unit rotating and the fixed shaft. Lower power can be selected to meet the rapid feed requirement.

**4. Stiffness:**

Has a higher trust and moment stiffness, because the integral unit has an angular contact construction. There is no backlash while rolling.

**5. Quietness:**

Special end cap design allows steel balls to circulate inside the nut. Noise generated by high speed operation is lower than in an ordinary ballscrew.

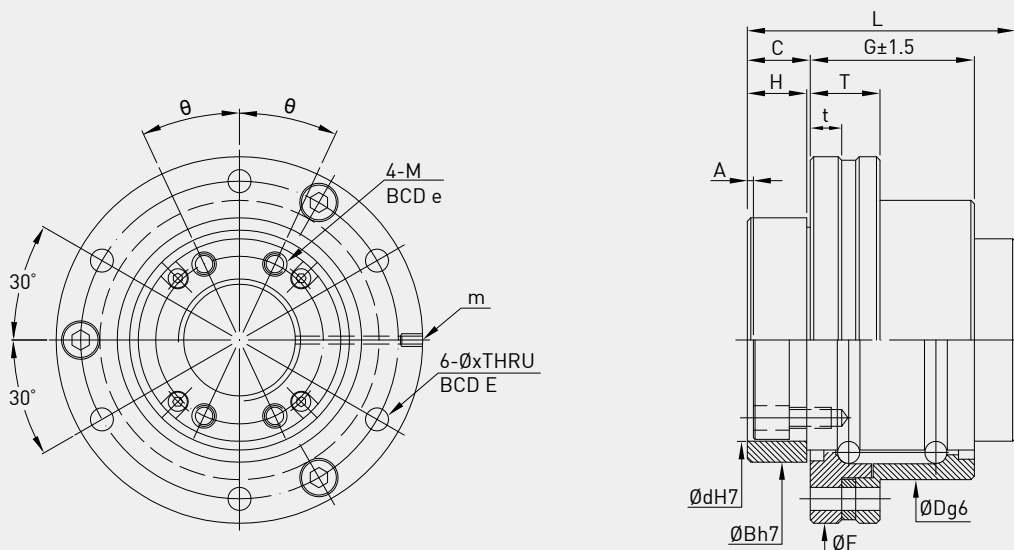
• **Specification:**

Example: 2R40-40S2-DFSHR1-800-1000-0.018



**HIWIN** R1 code

### R1 ROTATING NUT



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	819	1448	52	25	44	11.4	68	13	6	60	26	20	M4x0.7P	4.5	33	40	11	2	M4x0.7P
20-20S2	1145	2085	62	30	50	12	78	13	6	70	31	20	M5x0.8P	4.5	39	50	11	2	M4x0.7P
25-25S2	1228	2486	72	36	63	16.5	92	13	6	81	38	20	M6x1P	5.5	47	58	15.5	2	M4x0.7P
32-32S2	2010	4134	80	47	80	21	105	20	9	91	48	25	M6x1P	6.6	58	66	20	3	M6x0.75P
40-40S2	3127	6906	110	62	98	22.5	140	20	9	123	61	25	M8x1.25P	9	73	90	21.5	3	M6x0.75P

## 8.3 Heavy Load Ballscrew HL Series

HIWIN Heavy load ballscrews come with a special thread and return design which improves the load force a ballscrew can sustain. Compared to a normal ballscrew, it has a higher service life when applied under heavy load force.

### • Application:

Heavy Load ballscrews can be used on All-electric injection molding machines, Die-cast machines, Semi-conductor manufacturing machines, Heavy duty actuators, Forging machines etc.

### • Features:

#### 1. Heavy Load:

Load Capacity can be up to 2-3 times higher compared to standard series. It sustains a much heavier axial load and higher acceleration and deceleration.

#### 2. Accuracy:

JIS grade C7 accuracy.

#### 3. High Speed:

Super S and RD Series adopt tangent return design, DN Value is up to 160,000.

#### 4. Quietness:

RD Series Heavy Load Ballscrews adopt a tangent return design with spacers inserted in between the balls to help reduce noise created by friction between the balls.

**Nominal Diameter: Ø40~Ø125mm**

**Lead: 10~25mm**

**DN Value: Max. 130,000**



**External return type Heavy Load Ballscrew  
(External Return Type)**

**Nominal Diameter: Ø36~Ø125mm**

**Lead: 10~50mm**

**DN Value: Max. 160,000**

**(can include Q1 spacers)**



**External type Heavy Load Ballscrew  
(RD Series)**

**Nominal Diameter: Ø50~Ø80mm**

**Lead: 30~50mm**

**DN Value: Max. 160,000**



**Cassette return type Heavy Load Ballscrew  
(Super S Type)**

### • Technical Illustration:

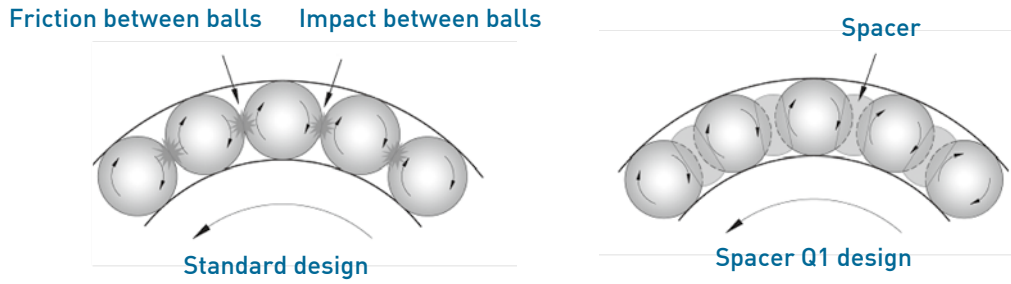
#### 1. High Load Design

(1) Special Groove design:

Heavy Load ballscrew HL Series uses special groove and optimum geometric design to reduce the axial load it can sustain and also improve its service life.

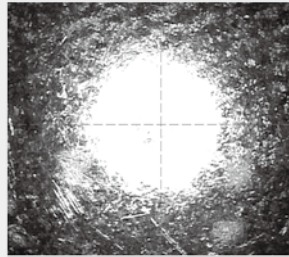
(2) Spacer (Q1)

In high load operation, strong friction will lower the service life of ballscrews. The Q1 spacer design eliminates the impact between the balls and further to improve the service life.

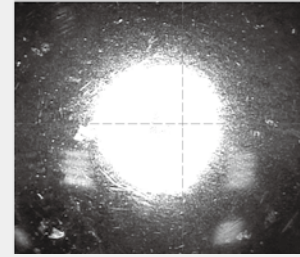


**High Load sustainability test**

Specification: R80-20Z2-FSPQ1  
 Max. Load: 277kN  
 Max. Speed: 1200RPM  
 Cycle time: 4s  
 Test distance: 1 million times  
 Lubricant: HIWIN G01



Ball surface without spacer

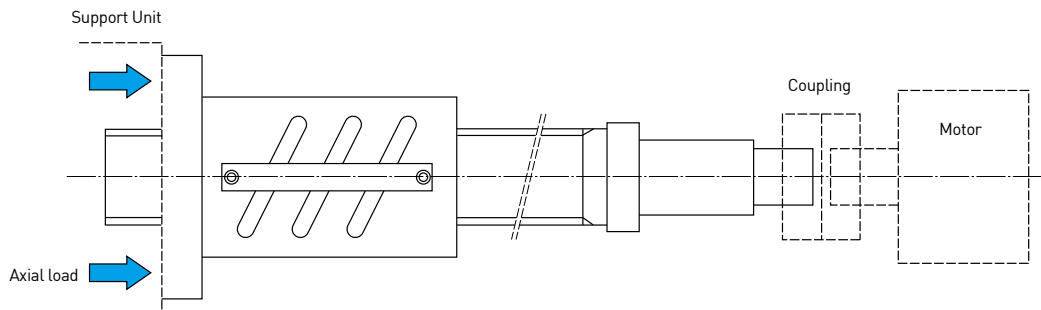


Ball surface with spacer

※ Recommend for temperatures not exceeding 70°C.

**2.Recommended Installation**

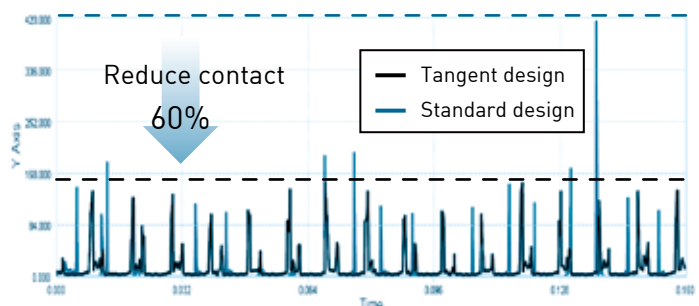
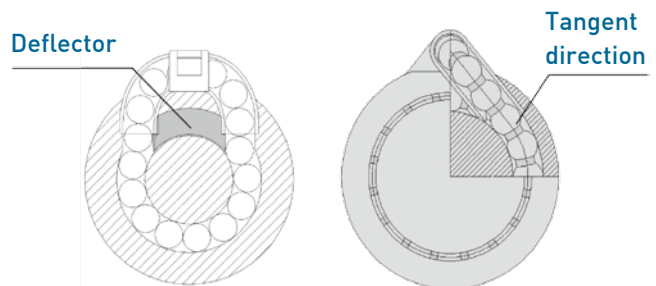
It is recommended to install the heavy load ball screws as per the picture illustrated below in order to protect balls from excessive wear and increase the service life of the ballscrew.



**3.High Dm-N Design**

(1) External Return Type  
 To reduce the wear caused by external force when at high speed, the return system is designed with a strong structure deflector and its DmN value can reach up to 130,000 MAX.

(2) Super S & RD Series  
 Super S and RD series uses tangent path recirculation design which helps to minimize the impact when balls pass through the return element and also improve the smoothness of the ballscrew. It can also reduce the operation noise, the DmN value can reach 160,000 max.



### 3. Quietness

RD series uses tangent return design and spacers between the balls which eliminates the contact of balls with the return element and also between the balls. It can reduce the noise of the ballscrew 5~7dBA as compared to the traditional external return design.

## • Precautions:

### 1. Lubrication

Sufficient lubrication is required for ballscrew operation in order to achieve the service life of the ballscrew. The grease will gradually deteriorate with use so it is important to periodically lubricate in order to maintain the efficiency of the ballscrew.

- ※ It is recommended that the grease used for lubrication to contains extreme pressure additives or use HIWIN G01 series grease.
- ※ To ensure the grease can lubricate the ball screw directly, it is recommended to have a lubrication hole on each circuit.

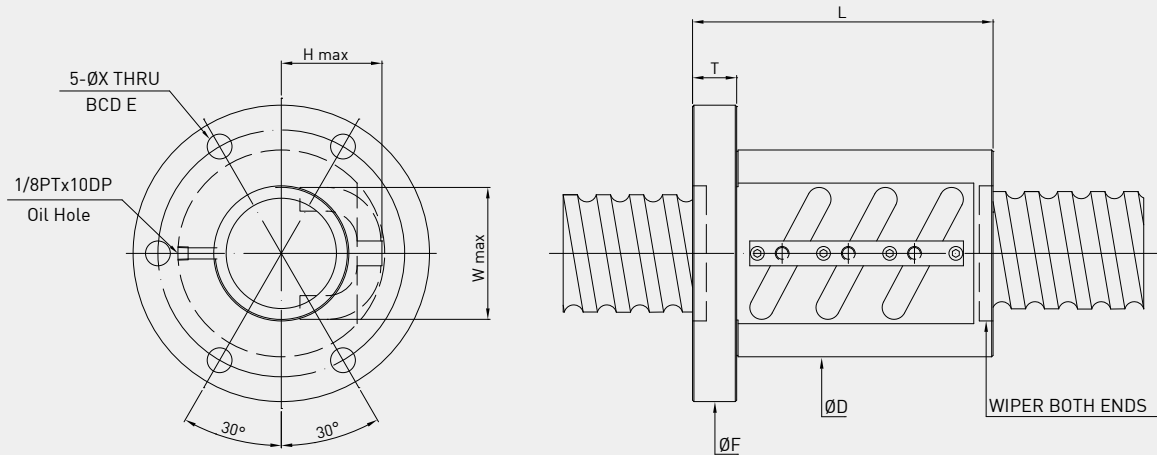
### 2. Lead Accuracy and Axial backlash

The standard accuracy for Heavy load ball screw (HL Series) is JIS C7 (0.05). To ensure the service life of the ball screw and avoid excessive rise in temperature, nuts are not preloaded. Standard backlash is 0.02~0.05mm MAX.

### 3. Axial Load

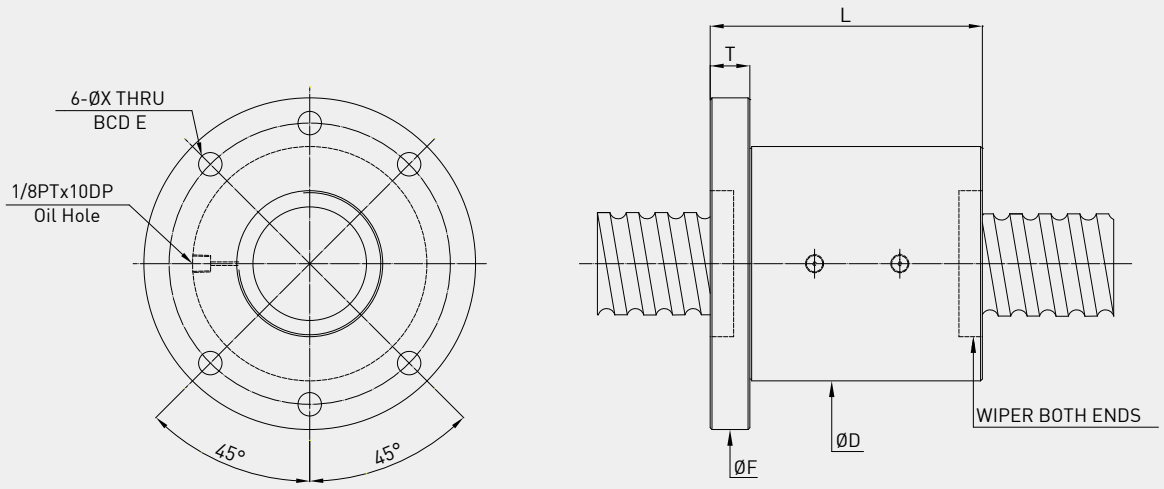
The dynamic load rating of the ballscrew should be about 3 to 5 times the expected axial load on the ballscrew in order to achieve a good service life.

## External return type Heavy Load Ballscrew (FSV)



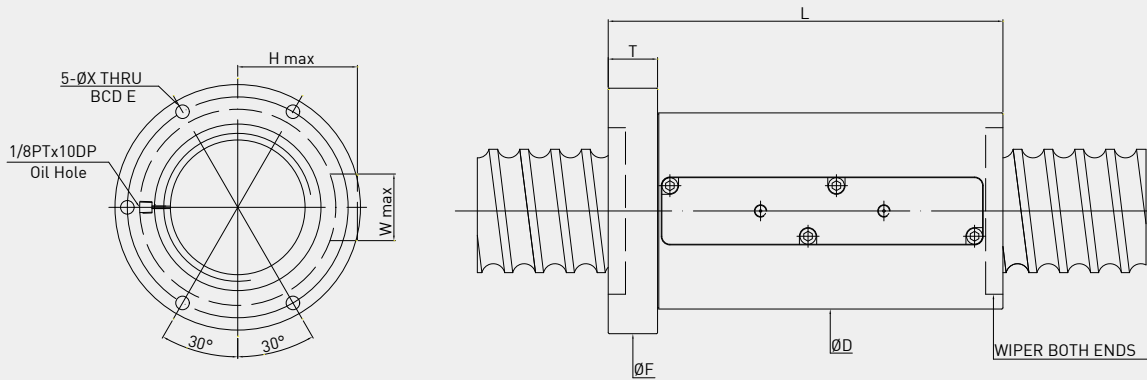
Model No.	Shaft diameter	Lead	Ball Dia.	Turns Circuits	Dynamic C		Static Co		D	L	F	T	E	X	H	W
					kgf	KN	kgf	KN								
R40-10B3	40	10	7.144	2.5X3	14150	138	44530	436	66	135	100	18	82	9	46	54
R45-10B3	45	10	7.144	2.5X3	14840	145	49820	488	70	143	104	18	87	9	47	57
R45-12B3	45	12	7.144	2.5X3	17050	167	55000	539	72	155	104	22	89	9	47	57
R50-10B3	50	10	7.144	2.5X3	15470	151	55090	539	75	143	109	18	92	9	49	57
R50-12B3	50	12	7.938	2.5X3	17930	175	61480	602	77	152	114	18	96	9	52	62
R50-16B3	50	16	12.7	2.5X3	33680	330	99140	971	95	223	129	28	112	9	61	66
R55-10B3	55	10	7.144	2.5X3	16050	157	60360	591	80	143	114	18	97	9	52	67
R55-12B3	55	12	7.938	2.5X3	18740	183	67960	666	82	160	114	22	97	9	54	69
R55-16B3	55	16	12.7	2.5X3	35040	343	107620	1054	99	223	133	28	116	9	71	70
R63-12B3	63	12	7.938	2.5X3	19790	193	77710	761	92	171	126	22	109	9	59	70
R63-16B3	63	16	12.7	2.5X3	37610	368	124230	1217	105	213	139	28	122	9	73	82
R63-16C3	63	16	12.7	3.5X3	50230	492	173920	1704	105	271	139	28	122	9	73	82
R63-20B3	63	20	15.875	2.5X3	50290	492	155020	1519	117	243	157	32	137	11	80	81
R80-14B3	80	14	9.525	2.5X3	28550	279	121130	1187	116	200	150	28	133	9	72	94
R80-16B3	80	16	12.7	2.5X3	41820	409	157530	1543	120	218	158	32	139	9	81	98
R80-20B3	80	20	15.875	2.5X3	56060	549	194320	1904	130	270	170	32	150	11	89.5	96
R80-20C3	80	20	15.875	3.5X3	74870	733	272050	2666	130	333	170	32	150	11	89.5	96
R80-25B3	80	25	19.05	2.5X3	72920	714	241490	2366	145	338	185	40	165	11	102	100
R100-16B3	100	16	12.7	2.5X3	46230	453	198970	1949	145	227	185	32	165	11	91	117
R100-20C3	100	20	15.875	3.5X3	83460	817	344600	3377	145	320	185	32	165	11	98	113
R100-25B3	100	25	19.05	2.5X3	80480	788	298050	2920	159	338	199	40	179	11	109	118
R100-25C3	100	25	19.05	3.5X3	107490	1053	417280	4089	159	413	199	40	179	11	109	118
R120-25B3	120	25	19.05	2.5X3	86740	850	354400	3473	173	316	213	40	193	11	111	135
R120-25C3	120	25	19.05	3.5X3	115850	1135	496160	4862	173	400	213	40	193	11	111	135

Cassette return type Heavy Load Ballscrew (FSC)



Model No.	Shaft diameter	Lead	Ball Dia.	Turns Circuits	Dynamic C		Static Co		D	L	F	T	E	X
					kgf	KN	kgf	KN						
2R50-30K6	50	30	7.144	6	12160	119.2	42360	415.1	85	123	135	20	115	12
2R50-40K6	50	40	12.7	6	25410	249	72310	708.6	115	159	165	28	140	14
2R50-40K8	50	40	12.7	8	33040	323.8	98130	961.7	115	199	165	28	140	14
2R63-40K6	63	40	15.875	6	38440	376.7	114220	1119.4	140	163	200	32	170	18
2R63-40K8	63	40	15.875	8	49990	489.9	155010	1519.1	140	203	200	32	170	18
2R80-50K6	80	50	15.875	6	42770	419.1	142960	1401	175	194	250	40	210	22
2R80-50K8	80	50	15.875	8	55620	545.1	194010	1901.3	175	244	250	40	210	22

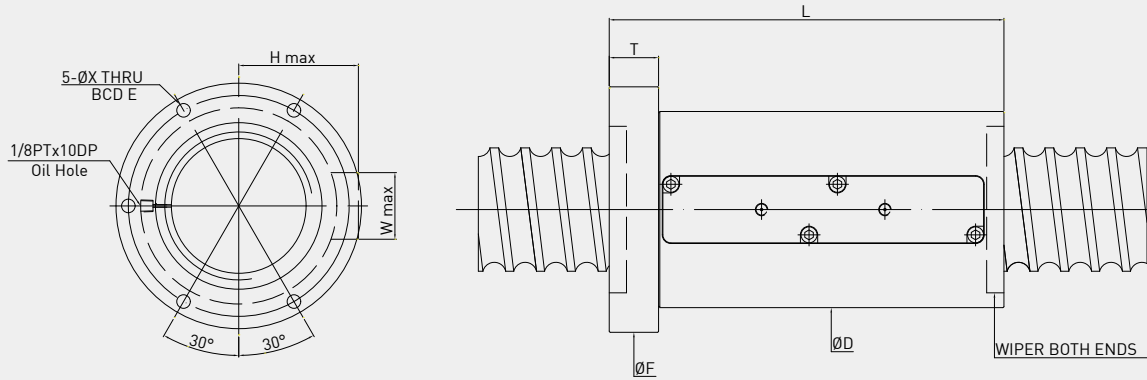
## External type Heavy Load Ballscrew (FSP)



Model No.	Shaft diameter	Lead	Ball Dia.	Turns Circuits	Dynamic C		Static Co		D	L	F	T	E	X	H	W
					kgf	KN	kgf	KN								
R36-10Z1	36	10	7.144	4.8×1	9070	88.9	25160	246.6	62	96	96	18	79	9	42	26
R36-12X2	36	12	7.144	2.8×2	10330	101.2	29310	287.2	66	129	100	18	80	9	45	27
R40-10Y2	40	10	7.144	3.8×2	14310	140.2	45130	442.3	66	135	100	18	82	9	45	27
R40-10Z1	40	10	7.144	4.8×1	9640	94.5	28500	279.3	66	95	100	18	82	9	45	27
R50-10X1	50	10	7.144	2.8×1	6630	65.0	20560	201.5	75	76	109	18	92	9	49	26
R50-12Z2	50	12	7.938	4.8×2	22170	217.3	78700	771.3	77	185	111	22	94	9	49.5	27
R50-14Y2	50	14	9.525	3.8×2	23360	228.9	75440	739.3	80	189	114	28	97	9	54	32
R50-16X3	50	16	12.7	2.8×3	37130	363.9	111030	1088.1	95	243	129	28	112	9	59.5	36
R50-16Y2	50	16	12.7	3.8×2	34060	333.8	100460	984.5	95	209	129	28	112	9	61	36
R50-16Y3	50	16	12.7	3.8×3	48280	473.1	150690	1476.8	95	291	129	28	112	9	61	36
R50-16Z1	50	16	12.7	4.8×1	22940	224.8	63450	621.8	95	145	129	28	112	9	61	33
R63-10Y2	63	10	7.144	3.8×2	17420	170.7	71750	703.2	90	139	125	18	109	9	55	27
R63-14Z2	63	14	9.525	4.8×2	31490	308.6	119310	1169.2	94	217	128	28	111	9	60.5	32
R63-16X2	63	16	12.7	2.8×2	29250	286.7	92760	909.0	105	179	139	28	122	9	67	37
R63-16Y2	63	16	12.7	3.8×2	38040	372.8	125880	1233.6	105	209	139	28	122	9	65.5	37
R63-16Y3	63	16	12.7	3.8×3	53910	528.3	188830	1850.5	105	289	139	28	122	9	65.5	37
R63-16Z2	63	16	12.7	4.8×2	46500	455.7	159010	1558.3	105	243	139	28	122	9	67	36
R63-16Z3	63	16	12.7	4.8×3	65910	645.9	238520	2337.5	105	339	139	28	122	9	67	36
R63-20X2	63	20	15.875	2.8×2	39120	383.4	115750	1134.4	117	217	157	32	137	11	72.5	41
R63-20Y2	63	20	15.875	3.8×2	50870	498.5	157090	1539.5	117	257	157	32	137	11	72.5	41
R63-20Y3	63	20	15.875	3.8×3	72090	706.5	235640	2309.3	117	359	157	32	137	11	75.5	42
R63-20Z2	63	20	15.875	4.8×2	62180	609.4	198430	1944.6	117	299	157	32	137	11	75.5	42
R80-16Y1	80	16	12.7	3.8×1	23300	228.3	79810	782.1	120	135	154	32	137	9	73	39
R80-16Z2	80	16	12.7	4.8×2	51710	506.8	201630	1976.0	120	247	154	32	137	9	74	39
R80-16Z3	80	16	12.7	4.8×3	73290	718.2	302450	2964.0	120	343	154	32	137	9	74	39
R80-20Y2	80	20	15.875	3.8×2	56700	555.7	196910	1929.7	130	259	170	32	150	11	80	45
R80-20Y3	80	20	15.875	3.8×3	80360	787.5	295370	2894.6	130	359	170	32	150	11	80	45
R80-20Z2	80	20	15.875	4.8×2	69320	679.3	248730	2437.6	130	299	170	32	150	11	80	45
R80-25Y2	80	25	19.05	3.8×2	73750	722.8	244710	2398.2	145	320	185	40	165	11	90	53
R80-25Y3	80	25	19.05	3.8×3	104520	1024.3	367070	3597.3	145	445	185	40	165	11	90	53

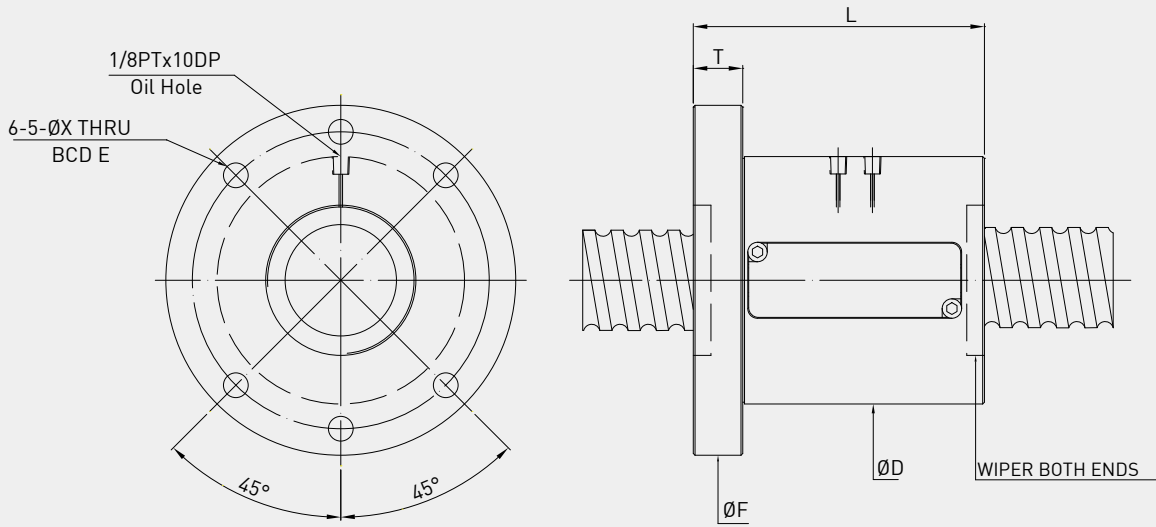


External type Heavy Load Ballscrew (FSP)



Model No.	Shaft diameter	Lead	Ball Dia.	Turns Circuits	Dynamic C		Static Co		D	L	F	T	E	X	H	W
					kgf	KN	kgf	KN								
R80-25Z2	80	25	19.05	4.8×2	90160	883.6	309110	3029.3	145	372	185	40	165	11	90	53
R100-20Y2	100	20	15.875	3.8×2	63210	619.5	249430	2444.4	145	255	185	32	165	11	90	49
R100-20Y3	100	20	15.875	3.8×3	89580	877.9	374140	3666.6	145	355	185	32	165	11	90	49
R100-20Z1	100	20	15.875	4.8×1	42570	417.2	157530	1543.8	145	175	185	32	165	11	90	49
R100-20Z2	100	20	15.875	4.8×2	77270	757.2	315070	3087.7	145	295	185	32	165	11	90	49
R100-20Z3	100	20	15.875	4.8×3	109510	1073.2	472600	4631.5	145	415	185	32	165	11	90	49
R100-25X2	100	25	19.05	2.8×2	62600	613.5	222540	2180.9	159	266	199	40	179	11	100	55
R100-25Y2	100	25	19.05	3.8×2	81410	797.8	302030	2959.9	159	320	199	40	179	11	100	59
R100-25Y3	100	25	19.05	3.8×3	115370	1130.6	453040	4439.8	159	445	199	40	179	11	100	59
R100-25Z2	100	25	19.05	4.8×2	99520	975.3	381510	3738.8	159	366	199	40	179	11	98	58
R120-25Y2	120	25	19.05	3.8×2	87740	859.9	359120	3519.4	173	316	213	40	193	11	109	56
R120-25Y3	120	25	19.05	3.8×3	124340	1218.5	538690	5279.2	173	441	213	40	193	11	109	59
R125-25Y2	125	25	19.05	3.8×2	89890	880.9	377880	3703.2	180	320	220	40	200	11	114	56
R125-25Z2	125	25	19.05	4.8×2	109890	1076.9	477320	4677.7	180	370	220	40	200	11	114	56

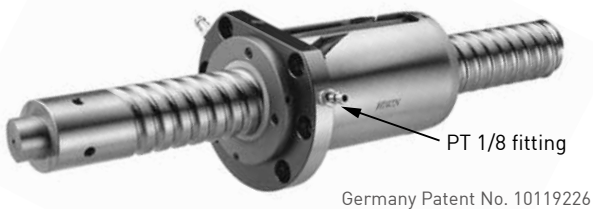
**External type Heavy Load Ballscrew (FSS)**



Model No.	Shaft diameter	Lead	Ball Dia.	Turns Circuits	Dynamic C		Static Co		D	L	F	T	E	X
					kgf	KN	kgf	KN						
2R50-40X2	50	40	12.7	2.8×2	25410	249.0	72310	708.6	115	189	165	32	140	14
R63-32X1	63	32	15.875	2.8×1	21350	209.2	57470	563.2	140	173	190	32	165	14
R63-32Z1	63	32	15.875	4.8×1	33950	332.7	98520	965.5	140	238	190	32	165	14
2R63-40Y2	63	40	12.7	3.8×2	37290	365.4	123970	1214.9	130	229	190	32	160	18
2R63-50Y2	63	50	12.7	3.8×2	36810	360.7	122740	1202.9	130	275	190	36	160	18
2R63-40X2	63	40	12.7	2.8×2	28670	281.0	91350	895.2	130	189	190	32	160	18
2R70-40X2	70	40	12.7	2.8×2	30590	299.8	103750	1016.8	142	191	210	32	175	18
2R80-50X2	80	50	15.875	2.8×2	42770	419.1	142960	1401.0	175	233	250	40	210	22
2R80-50Y2	80	50	15.875	3.8×2	55620	545.1	194010	1901.3	175	283	250	40	210	22

## 8.4 Cool Type

### 8.4.1 Extra High Dm-N Value Ballscrew - Cool Type I



#### • Cool type I:

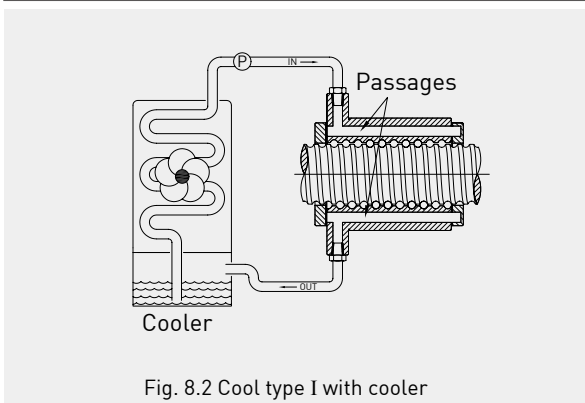
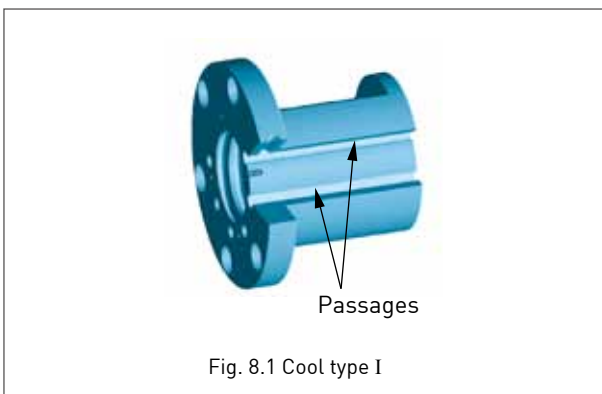
- New era for high speed ballscrew - achieving extra high Dm-N value (up to 200,000) and high positioning accuracy.
- Cool type I and a hollow shaft design.
- High speed machine tools and machining center.

#### • Design Principle:

The cool type series features forced cooling fluid passing through the nut, to minimize heat generation and thermal expansion during ballscrew operation.

##### • Cool type I as shown in the Figure 8.1:

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



#### • Specification:

1. We recommend shaft a diameter above  $\varnothing 32\text{mm}$  for cool type design.
2. Nut type: FSV, FSW, PFDW, OFSW, DFSV, FSH, FSI, etc.
3. Please contact HIWIN with other specifications you need.
4. The cool type I, compared with standard specifications, will cause a minor external dimension change of the nut, please contact HIWIN.

#### • Specification number:

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



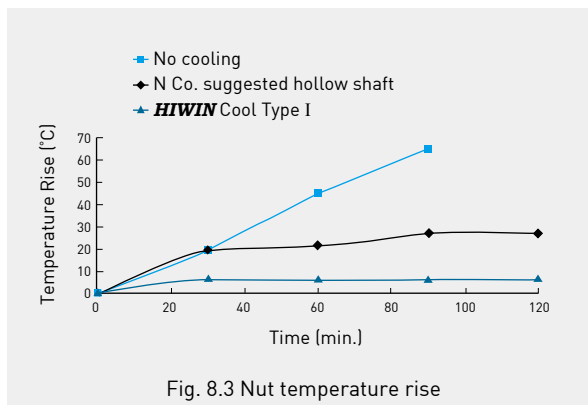
C1: HIWIN cool type ballscrew for type I

#### • Performance Comparison:

For high-speed machine tools, the hollow shaft design only is not enough protection against heat generation and thermal expansion, because nut itself is a heat source, as shown in Figure 8.3.

##### Test condition :

specification :  $\varnothing 50$ , lead 30 mm  
 speed : 2500 rpm ( 75 m/min),  
 back and forth feed continuously  
 acceleration :  $9.8 \text{ m/sec}^2$   
 stroke : 1180 mm  
 preload : 205 kgf  
 moving weight : 300 kgf  
 cooling rate : oil 2.5 liter/min  
 inlet temperature :  $16^\circ\text{C}$   
 room temperature :  $25^\circ\text{C}$



### Cool type I Performance (1)

Specification: Ø50, lead 30 mm  
Dm-N value: 150,000  
Acceleration: 9.8 m/sec<sup>2</sup>

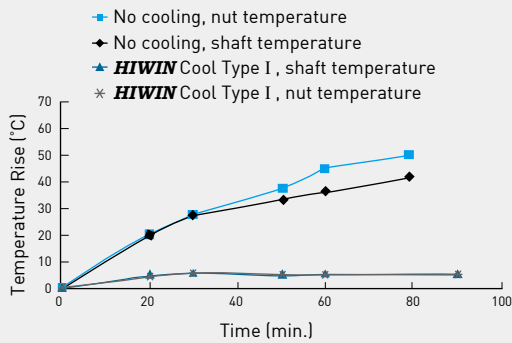


Fig. 8.4 Cool type I : Temperature rise of ballscrew

### Cool type I Performance (2)

Specification: Ø50, lead 30 mm  
Dm-N value: 200,000  
Acceleration: 9.8 m/sec<sup>2</sup>

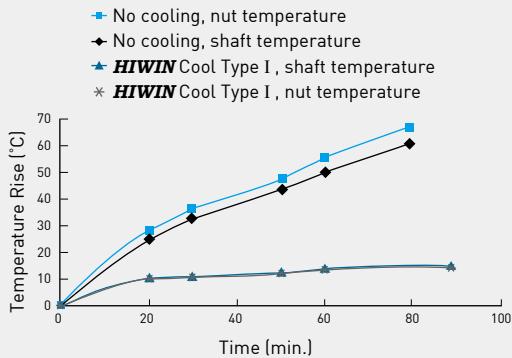


Fig. 8.5 Cool type I : Temperature rise of ballscrew

### • Features:

- 1. Optimized design for high reliability:**  
Through use of computer simulation and FEM analysis, the cool type ballscrew features excellent thermal protection and high reliability.
- 2. Promote higher speed rotation and extra high Dm-N value (up to 200,000):**  
Cool type ballscrews will eliminate high-speed rotation aftereffect, i. e., thermal problems, and promote higher speed rotation.
- 3. Prevent thermal distortion:**  
Optimized heat transfer design minimizes heat generation and prevents thermal distortion.
- 4. Strengthen durability:**  
When operating repeatedly, friction between balls causes heat generation. That may cause balls to oxidize or decarburize, and shorten the service life. Cool type ballscrews will strengthen durability under a cooling environment.
- 5. Extended lubricant life cycle:**  
When using lubrication, minimum heat generation further inhibits deterioration in the quality of lubrication and extends the lubricant life cycle.
- 6. Keep temperature uniform and reduce warm-up time:**  
During high-speed operation, nut and shaft cooling effect keeps feed-system temperature constant and reduces warm-up time.
- 7. Higher feeding accuracy:**  
Cooling effect of cool type ballscrew will stabilize against thermal expansion and equalize feeding accuracy.

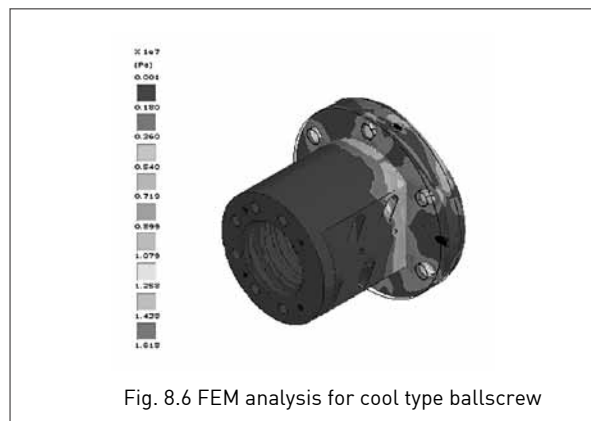


Fig. 8.6 FEM analysis for cool type ballscrew

### 8.4.2 High Load Ballscrew - Cool Type II



Germany Patent No. 20119457.0  
Taiwan Patent No. 193878

• **Cool type II:**

- New era for ballscrews applied in electric - driven injection machines, presses, power units, and other replaceable hydraulic drives.
- Electric-driven injection machines, presses, power units and other replaceable hydraulic drives.

• **Design Principle:**

The cool type series features forced cooling fluid passing through the nut, to minimize heat generation and thermal expansion during ballscrew operation.

• **Cool type II as shown in the Figure 8.7:**

Flowing fluids are circulated through a space, inside the nut, and exchanges heat with the cooler as shown in the Figure 8.8. It is most suitable for electric-driven injection machines, presses, and power units. The cool type II, compared with the standard specifications, will cause a minor external dimension change of the nut. Please contact HIWIN .

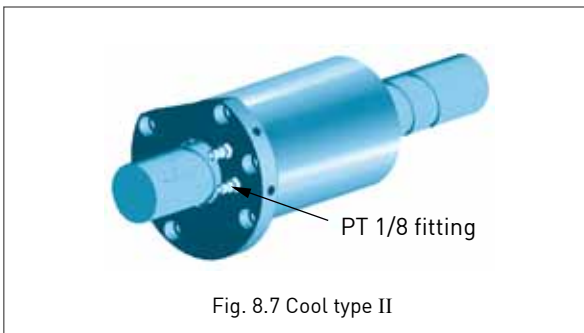


Fig. 8.7 Cool type II

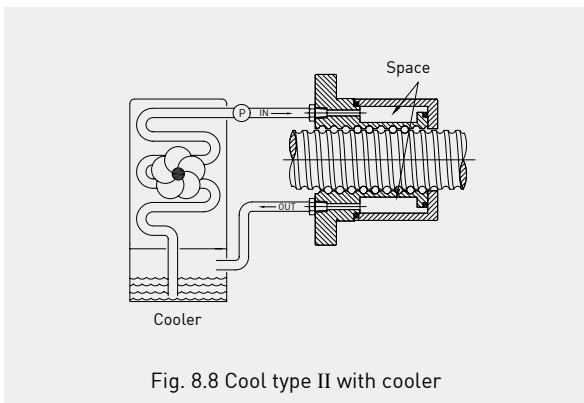


Fig. 8.8 Cool type II with cooler

• **Specification:**

1. We recommend a shaft diameter above  $\varnothing 32\text{mm}$  for cool type design.
2. Nut type: FSV, FSW, PFDW, OFSW, DFSV, FSH, FSI, etc.
3. Please contact HIWIN with other specifications you need.
4. The cool type II, compared with standard specifications, will cause a minor external dimension change of the nut, please contact HIWIN.

• **Specification number:**

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



C2 : HIWIN cool type ballscrew for type II

• **Performance Comparison:**

**Test condition :**

- specification :  $\varnothing 50$ , lead 30 mm
- speed : 1500 rpm ( 45 m/min),  
back and forth feed continuously
- acceleration :  $4.9 \text{ m/sec}^2$
- stroke : 300 mm
- preload : 205 kgf
- moving weight : 300 kgf
- cooling rate : oil 2.5 liter/min
- inlet temperature :  $16^\circ\text{C}$
- room temperature :  $25^\circ\text{C}$

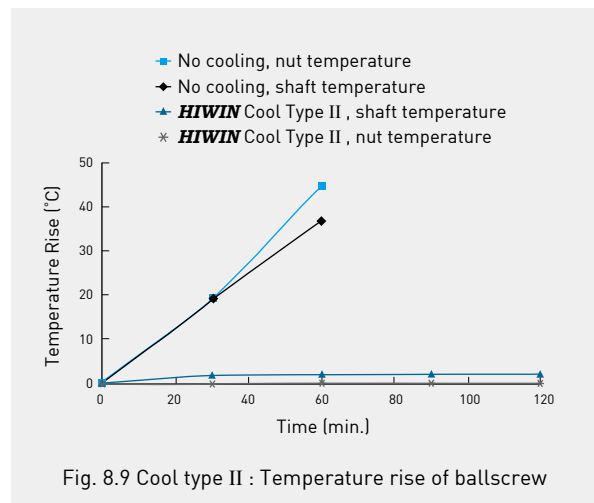


Fig. 8.9 Cool type II : Temperature rise of ballscrew

• **Features:**

**1. Optimized design for high reliability:**

Through use of computer simulation and FEM analysis, the cool type ballscrew features excellent thermal protection and high reliability.

**2. Promote higher speed rotation and extra high Dm-N value (up to 200,000):**

Cool type ballscrews will eliminate high-speed rotation aftereffect, i. e., thermal problems, and promote higher speed rotation.

**3. Prevent thermal distortion:**

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

**4. Strengthen durability:**

When operating repeatedly, friction between balls causes heat generation, It may cause oxidization and decarburization of the rolling elements, which will affect service life of ballscrews. Cool type ballscrews will strengthen durability under a cooling environment.

**5. Extended lubricant life cycle:**

When using lubrication, minimum heat generation further inhibits deterioration in the quality of lubrication and extends the lubricant life cycle.

**6. Higher feeding accuracy:**

Cooling effect of cool type ballscrew will stabilize against thermal expansion and equalize feeding accuracy.

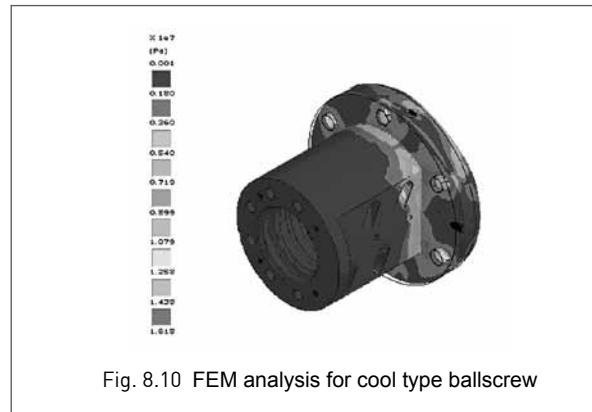


Fig. 8.10 FEM analysis for cool type ballscrew

**Average Life Cycle for Injection Machine Ballscrew**

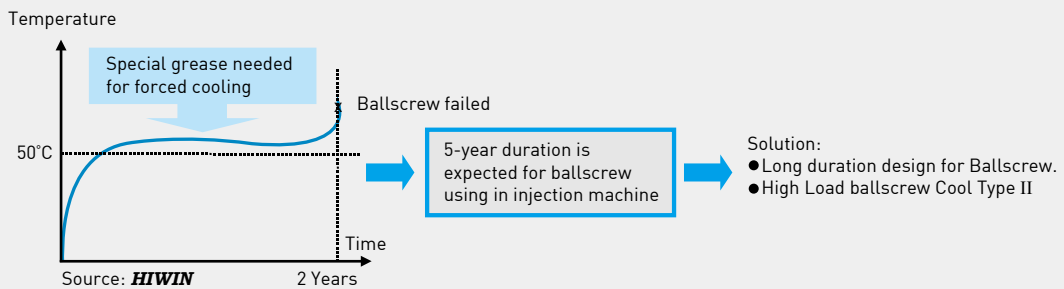


Fig 8.11 Life cycle for ballscrew using in general injection machine

## 8.5 Dust-proof Type



### • Features:

The dust-proof ballscrew is designed to prevent particles or debris entering the ballnut, especially under special operating conditions such as saw dust, iron filings, etc.

### • Dust-proof specification:

4R25-25K2-FSCSH-1835-1959-0.023



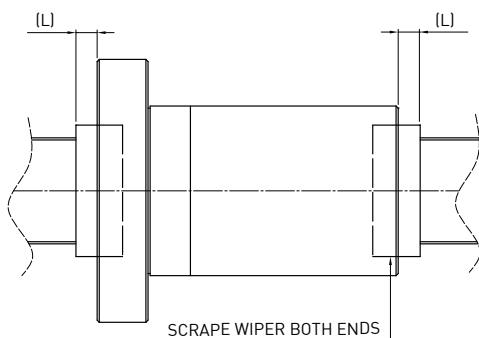
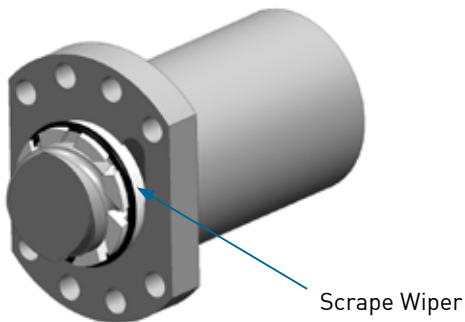
**HIWIN** Dust-Proof Code (SS, SH, NW, EW)

### • Dust-proof Type

#### 1. SS (Scrape Wiper)

Protruding from the end surface of a ball nut, flexible finger parts are pressed by a spring to eliminate the gap, fit the shaft surface perfectly, and improve the dustproof ability dramatically.

The slit between the fingers can remove the particles scraped from the shaft surface. Available sizes for SS type ballscrew are shown in the table.

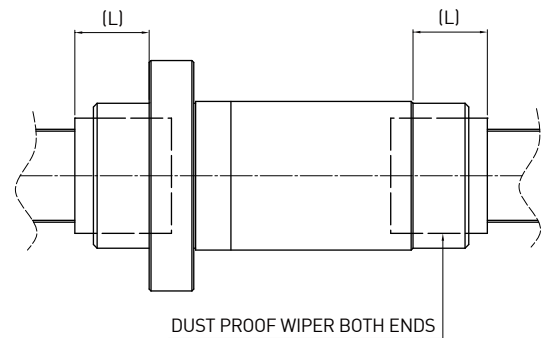
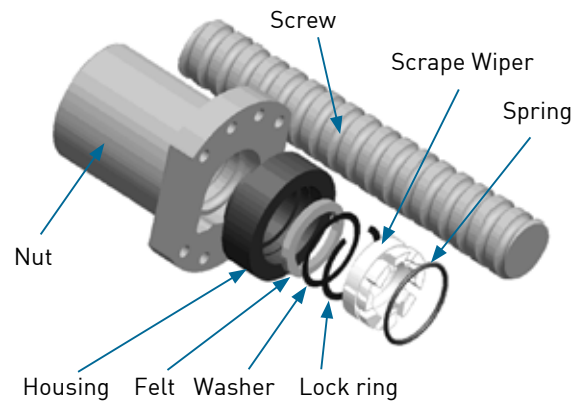


Nominal diameter	Lead	L Max.
25	-	5
32	-	5
36	< 10	5
	≥ 10	6
40	< 10	5
	≥ 10	6
45	< 10	5
	≥ 10	6
50	< 10	5
	≥ 10	6

Unit:mm

#### 2. SH (Felt + Scrape Wiper)

Finger wiper and high dense felt prevents powdery dust and improve dustproof effect.

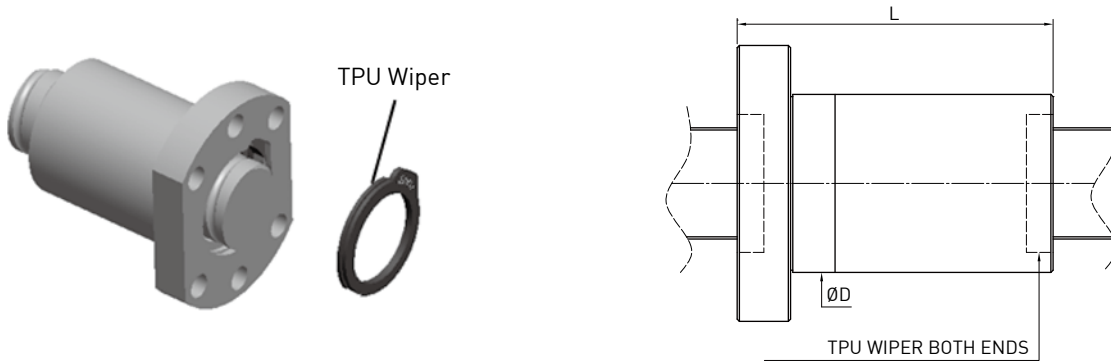


Nominal diameter	Lead	L Max.
25	-	20
32	< 10	20
	≥ 10	25
36	< 10	20
	≥ 10	25
40	< 10	20
	≥ 10	30
45	< 10	20
	≥ 10	30
50	< 10	20
	≥ 10	30

Unit:mm

3. EW (Wiper)

High dust-proof EW wiper is designed for standard DIN nut of Roller ballscrew, suited for applications like woodworking machining, graphite machining etc.

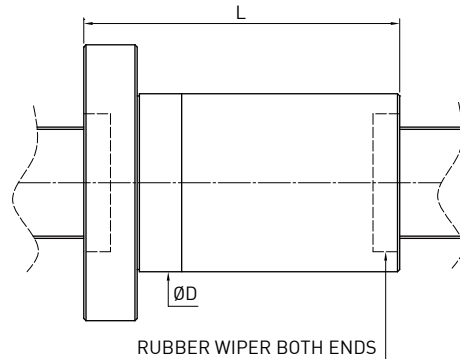
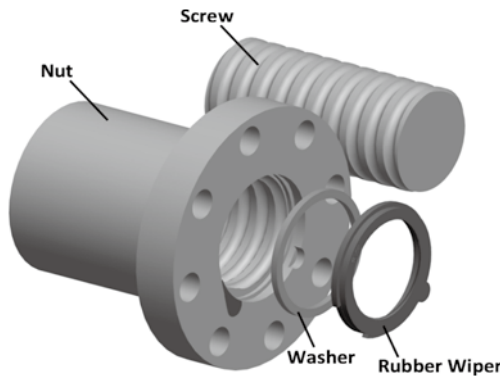


Model	Ball Dia. (mm)	Nominal Dia. (mm)	Lead (mm)	Dynamic Load C(kgf)	Static Load Co(kgf)	ØD	L
R12-5K3	2	12	5	540	900	24	28
2R12-10K2	2.381	12	10	440	660	24	33
R15-5K4	3	15	5	1290	2140	28	38
L15-5K4	3	15	5	1290	2140	28	38
2R15-10K3	3	15	10	1010	1670	28	45
4R15-16K3	3	15	16	1010	1730	28	61
R20-5K4	3	20	5	1500	2930	36	40
2R20-10K4	3	20	10	1520	3050	36	60
4R20-20K3	3.175	20	20	1250	2420	36	77
R25-5K5	3	25	5	2040	4680	38	57
R25-10K4	3	25	10	1660	3680	40	64
4R25-25K4	3.175	25	25	1380	3990	40	71
R32-5K4	3.175	32	5	2070	5360	50	48
R32-10K5	3.969	32	10	3390	8160	50	77
2R32-20K3	3.969	32	20	2130	4890	50	84
4R32-32K2	3.969	32	32	1440	3170	50	88
R38-10K4	6.35	38	10	5660	12410	63	70
2R38-20K3	6.35	38	20	4300	9060	63	88
4R38-40K2	6.35	38	20	2900	5910	63	108



4. NW (Wiper)

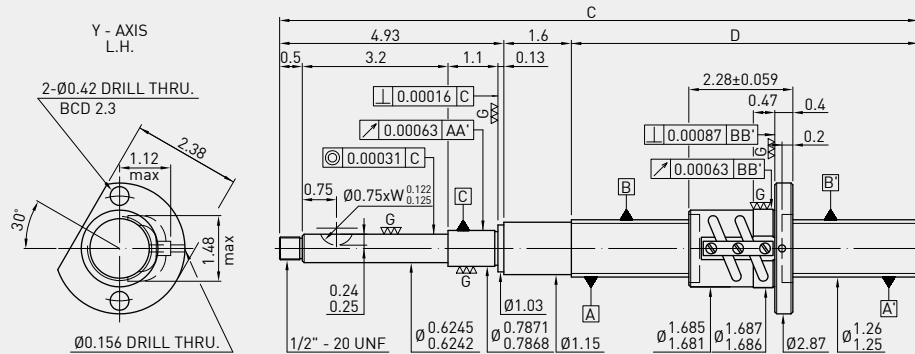
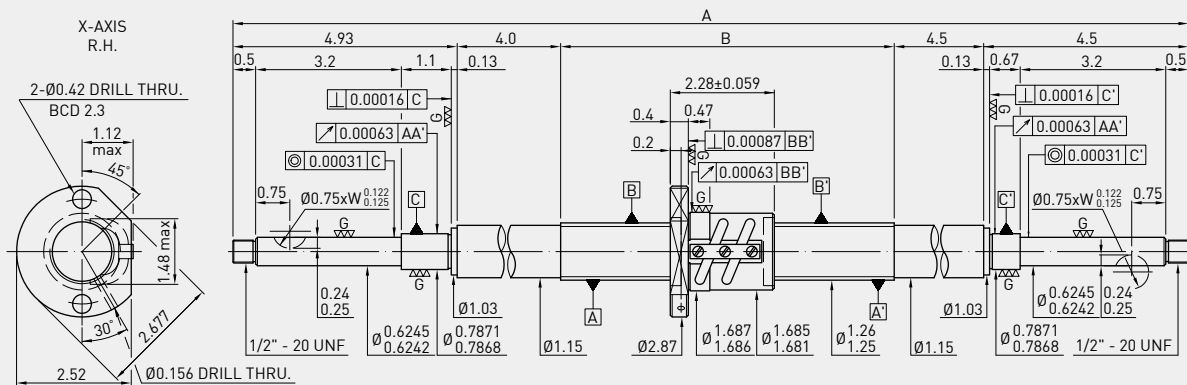
Seal type NW wiper is designed for standard DIN nut of Roller ballscrew, suited for applications like transport equipment, automation equipment etc.



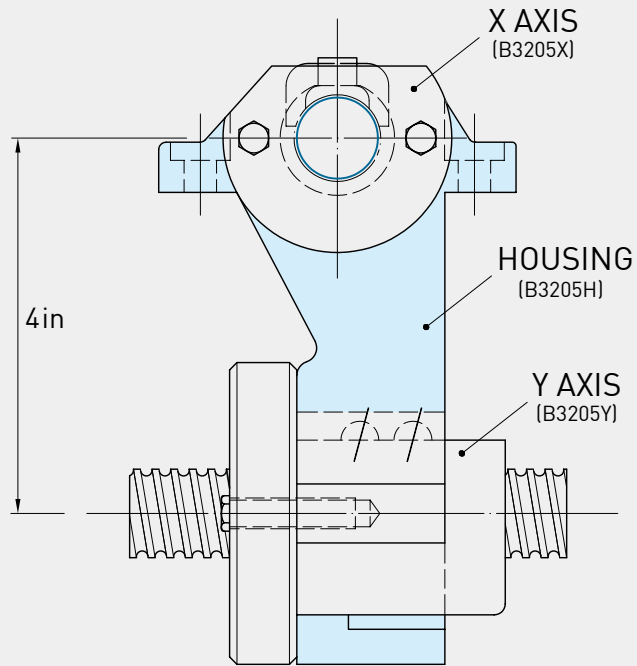
Model	Ball Dia. (mm)	Nominal Dia. (mm)	Lead (mm)	Dynamic Load C(kgf)	Static Load Co(kgf)	ØD	L
2R12-10K3	2.381	12	10	520	1030	24	43
2R15-10K3	3.175	15	10	860	1740	34	44
4R15-16K3	3	15	16	810	1730	28	61
4R15-20K2	3.175	15	20	570	1130	34	50
R16-5T3	3.175	16	5	664	1195	28	40
R16-10T3	3.175	16	10	623	1102	28	60
R20-5K4	3.175	20	5	1340	3270	36	40
R20-10K3	3.175	20	10	990	2260	36	47
4R20-20K2	3.175	20	20	690	1560	36	57
R25-5K5	3.175	25	5	1820	5240	40	48
R25-10K4	3.175	25	10	1480	4120	40	61
4R25-25K2	3.175	25	25	760	1950	40	70
R32-5K4	3.175	32	5	1660	5370	50	38
R32-10K4	3.969	32	10	2210	6470	50	63
2R32-20K3	3.969	32	20	1710	4890	50	88
4R32-32K2	3.969	32	32	1160	3170	50	88
R38-10K4	6.35	38	10	4550	12410	63	70
2R38-20K4	6.35	38	20	4490	12290	63	108
4R38-40K2	6.35	38	40	2330	5910	63	102
R40-5K5	3.175	40	5	2200	8320	63	45
R40-10T3	6.35	40	10	2651	6366	63	74
4R40-40K2	6.35	40	40	2390	6260	70	102
R48-10K6	6.35	48	10	7330	24280	75	90
R50-5K6	3.175	50	5	2830	12720	75	50
R50-10T4	6.35	50	10	3899	11112	75	89
R63-10T4	6.35	63	10	4369	14273	90	91

## 8.6 Ballscrew Retrofit Kits for Manual Milling Machine

1. Precision ground, lead accuracy within  $\pm 0.0005''$  /ft.
2. Stock size meet various CNC systems' requirements.
3. High strength and long service life.



unit: inch



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	Part 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 <sup>6</sup> revs)	4158 lbf
Lead Accuracy	0.0003"/2π; 0.0005"/ft
Drag Torque(Preload)	3.5in-lb (280lbs)

# 9. HIWIN GREASE

## 9.1 HIWIN G01 Heavy-load Grease

### • Features

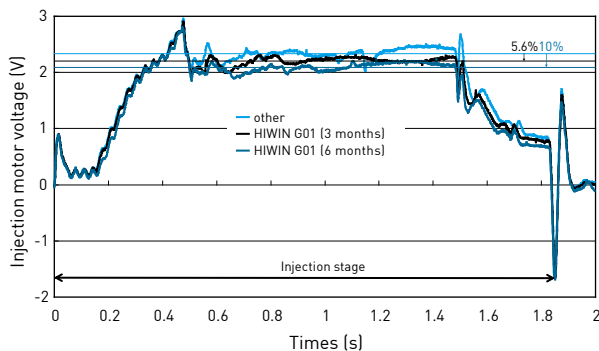
1. Excellent wear resistance and extreme pressure resistance under heavy load conditions.
2. Low friction in low temperatures.
3. Water resistant.
4. Can be applied by a central lubrication system.
5. Suitable for all-electric injection molding machine, die-stamping machines, semi-conductor manufacturing equipment, heavy load actuator, industry machine and forging machine.

### • Basic Properties

		HIWIN G01
Color		Light yellow
Base Oil		Mineral oil
Consistency Enhancer		Polyurea
Additive		Solid lubricant
Service Temp. (°C)		-15~115
NLGI-grade (0.1mm)		310-340
Viscosity (cst)	40°C	500
	100°C	30
Drop Point (°C)		> 170
4-ball test	Load on boundary lubrication when 900rpm (N)	>1700
	Load on boundary lubrication when 1770rpm (N)	>1300

	HIWIN G01	other	Note	
Property of anti extreme pressure	●	▲	4-ball test 900rpm	42% more
			1770rpm	30% more
Anti wear	●	▲	4-ball test 80kgf 30rpm	23% more
Low friction	●	▲	Injection motor votage	10% lower
Water resistance	●	●		
Rust proof	●	●	Corrosion on copper test	
Service temperature range	-15 ~115	-20 ~130		

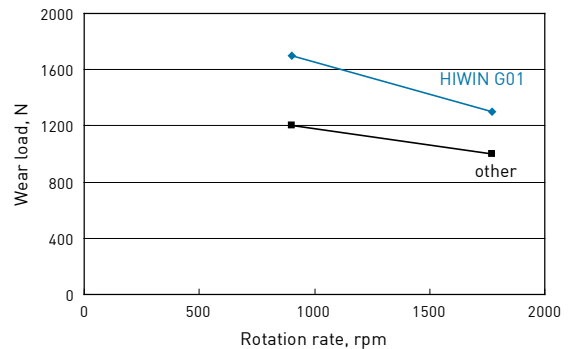
### • All-electric injection molding machine(80ton) — motor driving voltage of injection unit BS



### • Test of Resistance to Extreme Pressure

#### Test Condition and Measurement

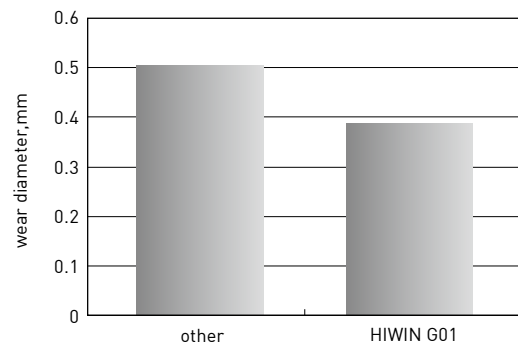
Ball diameter	1/2 in
Temperature	27°C
Test time	10 sec
Rotational speed	900 \cdot 1770 rpm
measurement	Load when ball wear diameter become 500 μm



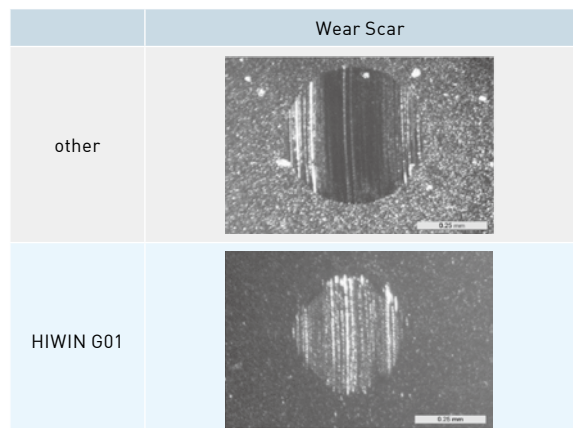
### • Test of Anti-wear

#### Test Condition and Measurement

Ball diameter	1/2 in
Temperature	75°C
Test time	60 min
Rotational speed	30 rpm
load	80 kgf
measurement	Wear diameter of ball contact point



Comparison of wear diameter



Comparison of wear scar

## 9.2 HIWIN G02 Low Particle-emitting Grease

### • Features

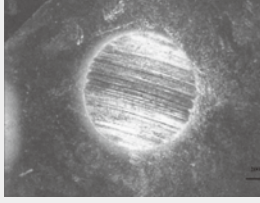
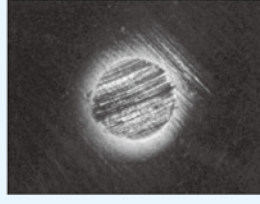
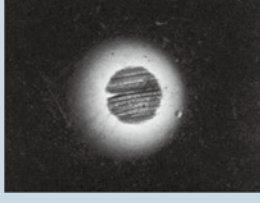
- 1.Low dust generation, suitable for clean room environment.
- 2.Wear resistant.
- 3.Long term grease, suitable for wide temperature range.
- 4.Consists of synthetic hydrocarbon oil and special calcium soap. resistant to oxidation and aging.
- 5.Can be used in plastic/steel and plastic/plastic components, compatible with elastomers and plastic materials.

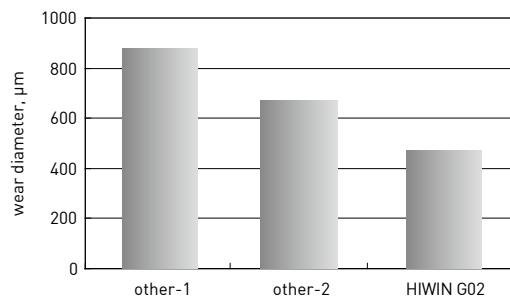
### • Basic Properties

		HIWIN G02
Color		Beige
Base Oil		Synthetic hydrocarbon oil
Consistency Enhancer		Special calcium soap
Service Temp. [°C]		-30~140
NLGI-grade (0.1mm)		265-295
Viscosity (cst)	40°C	100
	100°C	15
Drop Point [°C]		>180
4-ball test (ASTM D2266)		474μ

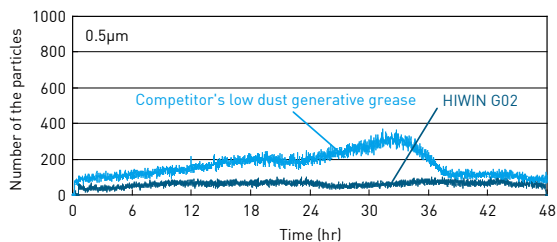
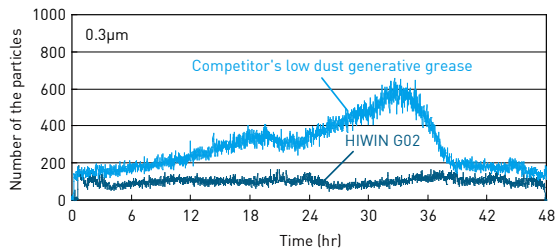
	HIWIN G02	other	Note
Anti wear	●	▲	4-ball test (ASTM D2266) 46%more
Dust generation	●	▲	Dust generation of KK in clean room
Anti-Corrosion	●	●	
Service Temperature Range	-30~140	-30~120	

### • 4-ball test(ASTM D2266)

	Wear Scar	Diameter (μm)
other-1		879
other-2		669
HIWIN G02		474



### • Dust generation



## 9.3 HIWIN G03 Low Particle-emitting (High Speed) Grease

### • Features

- 1.Low dust generation characteristics and suitable for clean room environment.
- 2.Wear resistant under high speed conditions.
- 3.Long term grease, well wear resistance under high speed conditions.
- 4.Low starting and running torques particularly at low temperatures, to ensure high efficiency and conserve energy.
- 5.Compatible with plastic components.

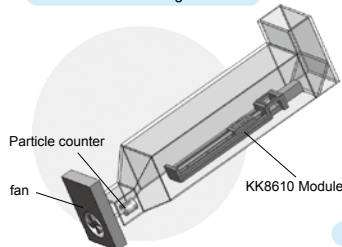
### • Basic Properties

		HIWIN G03
Color	Beige	
Base Oil	Synthetic hydrocarbon oil	
Consistency Enhancer	Special calcium soap	
Service Temp. (°C)	-45~125	
NLGI-grade (0.1mm)	265-295	
Viscosity (cst)	40°C	30
	100°C	5.9
Drop Point (°C)	>210	
4-ball test (ASTM D2266)	366µm	

	HIWIN G03	other	Note
Anti wear	●	●	4-ball test (ASTM D2266) 15%more
Dust generation	●	●	Dust generation of KKin clean room
Friction torque at low speed	●	▲	7~15 % lower less than 500rpm
Friction resistance at high speed	●	▲	Motor voltage 1.2~2.6% lower
Service Temperature Range	-45~125	-10~80	

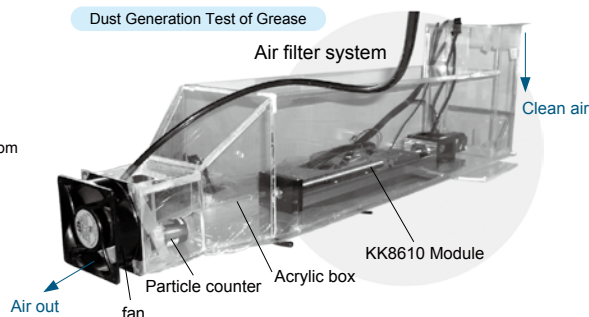
### • Dust generation

Test model of dust generation



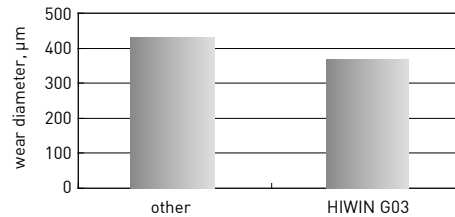
Test Condition : Air speed 2.5m/s  
Rotational Speed of Screw : 1000rpm  
Stroke : 210mm

Dust Generation Test of Grease

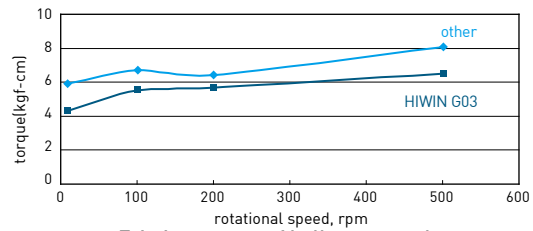


### • 4-ball test (ASTM D2266)

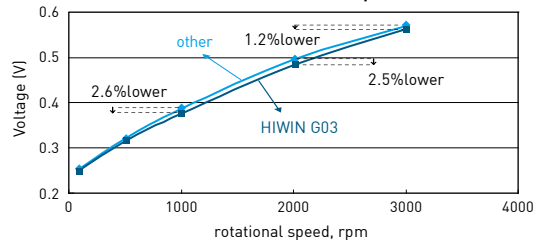
	Wear Scar	Diameter (µm)
other		432
HIWIN G03		366



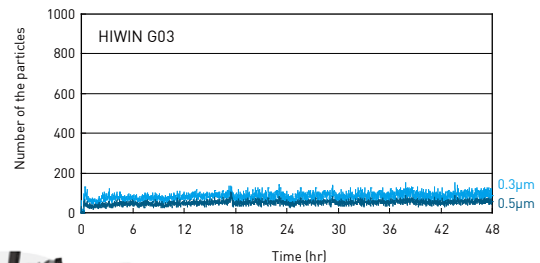
### • Wear resistance



Friction torque of ball screw under different rotational speed



Motor Driven Voltage Under Different Rotational Speed



## 9.4 HIWIN G04 High Speed Grease

- **Features**

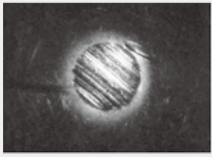
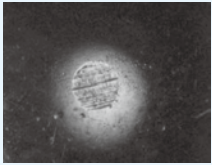
1. Wear resistant under high speed conditions
2. Low friction force under high speed conditions
3. Water resistant

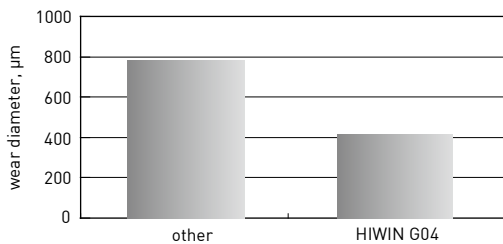
- **Basic Properties**

		HIWIN G04
Color		Beige
Base Oil		ESTER/PAO
Consistency enhancer		LITHIUM SOAP
Service Temp. (°C)		-35-120
NLGI-grade (0.1mm)		260-280
Viscosity (cst)	40°C	25
	100°C	6
Drop Point (°C)		>225
4-ball test (ASTM D2266)		418µm

	HIWIN G04	other	Note
Anti-wear	●	▲	4-ball test (ASTM D2266) 46% more
Low Friction	●	▲	motor voltage 4.6% lower at 3000rpm
Service Temperature Range	-45-125	-10-80	

- **4-ball test (ASTM D2266)**

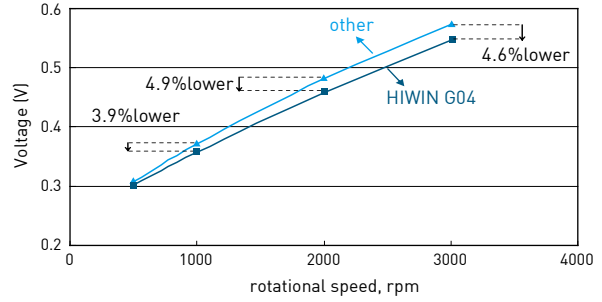
	Wear Scar	Diameter (µm)
other		781
HIWIN G04		418



- **Wear resistance**

Screw Type : 40-10

Test Condition : motor driven voltage by different grease and rotational speed



## 9.5 HIWIN G05 General Type Grease

- **Features**

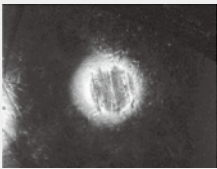
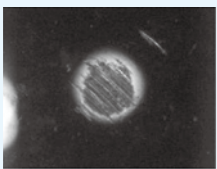
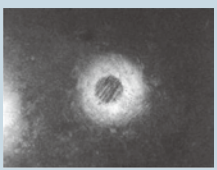
1. Wear resistant under high speed conditions
2. Low friction force under high speed conditions
3. Water resistant

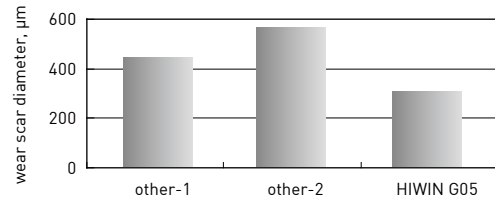
- **Basic Properties**

		HIWIN G05
Color		Brown
Base Oil		MINERAL
Consistency enhancer		LITHIUM SOAP
Service Temp. (°C)		-15~120
NLGI-grade (0.1mm)		2
Viscosity (cst)	40°C	200
Drop Point (°C)		190
4-ball test	Wear scar diameter(μm) (ASTM D-2266)	291μm
	Welding load (N) (DIN 51350-4)	2600/2800

	HIWIN G05	other	Note
Anti-wear	●	▲	4-ball test (ASTM D2266) increases 38%~49%
Low Friction	●	▲	increases 16%~19%
Service Temperature Range	●	●	

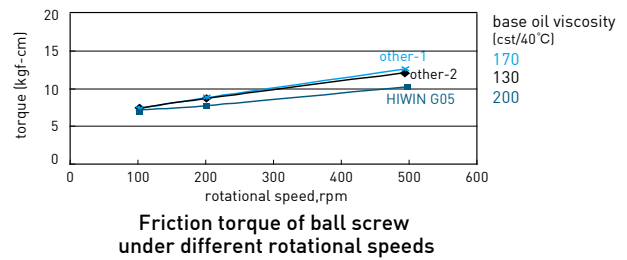
- **4-ball test (ASTM D2266)**

	Wear Scar	Diameter (μm)
other-1		468
other-2		567
HIWIN G05		291



- **Wear resistance**

Screw diameter : 40mm  
Lead : 10mm



Friction torque of ball screw under different rotational speeds



# A. Ballscrew Failure Analysis

## A1 Preface

In recent years, more and more ballscrews are installed in various machines to meet the requirements of higher accuracy and better performance. Ballscrews have become one of the most widely used power transmission components. In CNC machines, ballscrews help improve positioning accuracy and elongate service life. Ballscrews are also increasingly used to replace ACME screws in manually operated machines.

A ballscrew is normally preloaded to minimize the backlash of machine movement. Even a high precision ballscrew will not provide good accuracy and long service life if it is not installed properly.

This article discusses primary ballscrew problems and their precautions. Some measuring procedures are also discussed to help users locate the cause of an abnormal backlash.

## A2 Causes and Precautions for Ballscrew Problems

Three major categories of ballscrew problems and their precautions are discussed as follows.

### A2-1 Too much play

#### 1. No preload or insufficient preload :

The ball nut will rotate and move downward by its own weight when a non-preloaded ballscrew is held vertically with the screw spindle constrained. A significant backlash may exist in a non-preloaded ballscrew unit. Therefore non-preload ballscrews are only used in machinery, where low operation resistance but not positioning accuracy is the major concern.

HIWIN can determine the correct amount of preload based on different applications. We can also preset the amount of preload before shipment. Be sure to clearly specify the operation condition of your application when you order a ballscrew unit.

#### 2. Too much torsional displacement :

(1) Incorrect heat treatment, hardened layer too thin, non-homogeneous hardness distribution, or material too soft: Standard hardness of steel balls, ball nuts, and screw spindles are HRC 62-66, 58-62, and 58-62, respectively.

(2) Incorrect design-L/D ratio too high, etc:

The lower the L/D (length/diameter) ratio, the more rigid the spindle is. L/D ratio should be limited to under 60. (The accuracy grade related to this L/D range is shown in Table 4.10) There will be a significant deflection (torsional displacement ) if the L/D ratio is too high. The ballscrew installation shown in Fig A-1 is supported at one end only. This kind of "non-rigid" design should be avoided if possible.

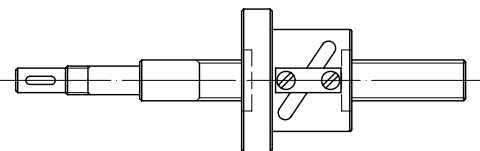


Fig. A-1 The installation of ballscrews.

#### 3. Inappropriate bearing selection :

Angular ball bearings should be used in ballscrew installation. A ball bearing with high pressure angle specially designed for ballscrew installation is an even a better choice. A regular deep groove ball bearing will generate a significant amount of axial play when axially loaded. It should not be used in this application.

#### 4. Inappropriate bearing installation :

(1) If the bearing is not attached to the screw spindle properly, it will cause axial play under load. This problem may be caused by the bearing journal of the screw spindle being too long or the non-threaded part of the screw spindle being too short.

(2) The perpendicularity between the bearing seating face and the thread axis of the bearing locknut on the ballscrew, or the parallelism between the opposite faces of the locknut is out of tolerance causing the bearing to tilt. The thread for bearing lock nut and the seating face of a bearing in the ballscrew journal should be machined in one setting to ensure the perpendicularity. It is even better if they can be ground.

(3) Two lock nuts and a spring washer should be used in the bearing installation to prevent them from getting loose in operation.

**5. The ball nut housing or the bearing housing is not rigid enough :**

The ball-nut-mounted housing or the bearing-mounted housing may deflect under components' weight or machining load if it is not rigid enough. The test illustrated in Fig A-4 (d) can be used to check the rigidity of the ball-nut-mounted housing. Similar tests can be used to check the rigidity of the bearing-mounted housing.

**6. The ball nut housing or the bearing housing is not mounted properly :**

- (1) Components may become loose due to vibration or lack of locating pin(s). Solid pins instead of spring pins should be used for locating purposes.
- (2) Ball-nut-seated screws are not seated firmly because the screws are too long or the thread holes on housing are too short.
- (3) Ball-nut-seated screws become loose due to vibration and lack of a spring washer.

**7. Parallelism or flatness of the housing surface is out of tolerance :**

In a machine assembly, a shim bar is frequently located between the housing location surface and the machine body for adjustment purpose. The clearance of table movement may vary at different locations if the parallelism or flatness of any matching component is out of tolerance no matter they are ground or scraped.

**8. The motor and the ballscrew spindle are not assembled properly :**

- (1) There will be a relative rotation between the motor shaft and the ballscrew spindle if the connecting coupling is not installed firmly or the coupling itself is not rigid enough.
- (2) Driving gears are not engaged properly or driving mechanism is not rigid. A timing belt should be used to prevent slipping if the ballscrew is to be driven by a belt.
- (3) Key is loose in the groove. Any inappropriate match among the hub, key, and key seat may cause these components to generate backlash.

## A2-2 Unsmooth operation

**1. Defects from ballscrew manufacturing :**

- (1) The track surface of the ballscrew spindle or the ball nut is too rough.
- (2) The roundness of the bearing balls, the ball nut or the ballscrew spindle is out of tolerance.
- (3) The lead or the pitch circle diameter of the ball nut / the spindle is out of tolerance.
- (4) The return tube is not attached to the ball nut appropriately.
- (5) Uneven bearing ball size or hardness. The above problems should not be found in the manufacturers of top quality.

**2. Foreign objects enter the ball path :**

- (1) Packing material is trapped in the ball path. Various materials and anti-rust paper are normally used to pack ballscrew units for shipment. It is possible to have these foreign materials or other objects trapped in the ball path if proper procedures are not followed while installing or aligning the ballscrew unit. This may cause the bearing balls to slide instead of rolling or even cause the ball nut to freeze completely.
- (2) Machined chips get in the ball track. The chips or dust generated during machining processes may be trapped in the bearing ball track if wiper kits are not used to keep them away from the surface of the ballscrew unit. This may cause unsmooth operation, deteriorate accuracy and reduce service life.

**3. Over-travel :**

Over-travel can damage the return tube and cause it to collapse or even break. When this happens, the bearing balls will not circulate smoothly. They may break and damage the groove on the ball nut or the ballscrew spindle under severe circumstances. Over-travel may happen during set-up or as the result of a limit switch failure or a machine collision. To prevent further damage, an over-traveled ballscrew should be checked or repaired by the manufacturer before it goes back into service.

**4. Damaged return tube:**

The return tube may collapse and cause the same problems as mentioned above if it is hit heavily during installation.

**5. Misalignment:**

Radial load exists if the center line of the ball nut's housing and the screw spindle's bearing support housing are

not aligned properly. The ballscrew unit may bend if this misalignment is too large. An abnormal wear may still happen even if the misalignment is not significant enough to cause a noticeable bending. The accuracy of a ballscrew unit will deteriorate rapidly if it is misaligned. The higher the preload is set in the nut, the more demanding the alignment accuracy is required in the ballscrew.

**6. The ball nut is not mounted properly on the nut housing:**

Eccentric load exists when the mounted ball nut is tilted or misaligned. If this is the case, the motor current may fluctuate during rotation.

**7. Ballscrew unit is damaged during transportation**

**A2-3 Fracture**

**1. Broken bearing ball :**

Cr-Mo steel is the most commonly used material for bearing balls. It takes about 1,400kg (3,080LB) to 1,600kg (3,520LB) to break a steel ball of 3.175 mm (1/8 in) diameter. The temperature of an under-lubricated or non-lubricated ballscrew raises substantially during operation. This temperature rise could make the bearing balls brittle or break which causes damage to the grooves of the ball nut or the ballscrew spindle consequently.

Therefore, lubricant replenishment should be considered during the design process. If an automatic lubricating system is not available, a periodic grease replenishment should be scheduled as part of maintenance program.

**2. Collapsed or broken return tube :**

Over-travel of the ball nut or an impact on the return tube could cause the return tube to collapse or break. This may block the path of bearing balls and cause them to slide instead of rolling and eventually break.

**3. Ballscrew spindle end breaks :**

- (1) Inappropriate design: Sharp corners on the ballscrew spindle should be avoided to reduce local stress concentration. (Fig. A2) shows some of the appropriate screw end designs.
- (2) Bend of screw spindle journal: The seating surface of the bearing of the ballscrew and the thread axis of the bearing's lock nut are not perpendicular to each other or the opposite sides of the lock nut are not parallel to each other. This will cause the end of screw spindle to bend and eventually break. The amount of deflection at the end of the ballscrew spindle (Fig A-3) before and after the bearing's lock nut being tightened should not exceed 0.01 mm (0.0004 in).
- (3) Radial force or fluctuating stress: Misalignment in the ballscrew installation creates abnormal fluctuating shear stress and causes the ballscrew to fail prematurely.

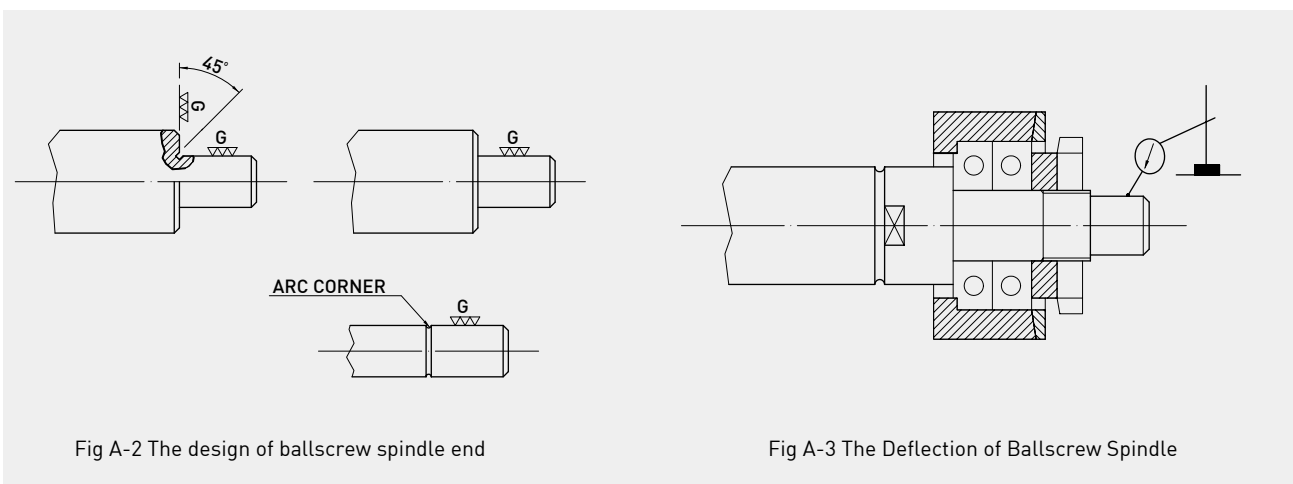


Fig A-2 The design of ballscrew spindle end

Fig A-3 The Deflection of Ballscrew Spindle

## A3 Locating the Cause of an Abnormal Backlash

The following measurement procedures can be performed to locate the cause of an abnormal backlash in the ballscrew installation.

1. Glue a gauge ball in the center hole at one end of the screw spindle. Use the flat plate of a dial indicator to check the axial movement of this gauge ball in axial direction while rotating the screw spindle (Fig A-4(a)). The movement should not exceed 0.003mm (0.00012 in), if the bearing hub, the ball nut, and the ball nut housing are all installed properly.

2. Use a dial indicator to check the relative movement between the bearing housing and the bearing seat while rotating the ballscrew (Fig A-4(b)). Any dial indicator reading other than zero indicates that either the bearing hub is not rigid enough or it is not installed properly.

3. Check the relative movement between the machine table and the ball nut housing (Fig A-4(c)).

4. Check the relative movement between the ball nut housing and the ball nut flange (Fig A-4(d)).

Contact the ballscrew manufacturer if an unsatisfactory backlash still exists while all the above checks are ok. The preload or the rigidity of the ballscrew may have to be increased.

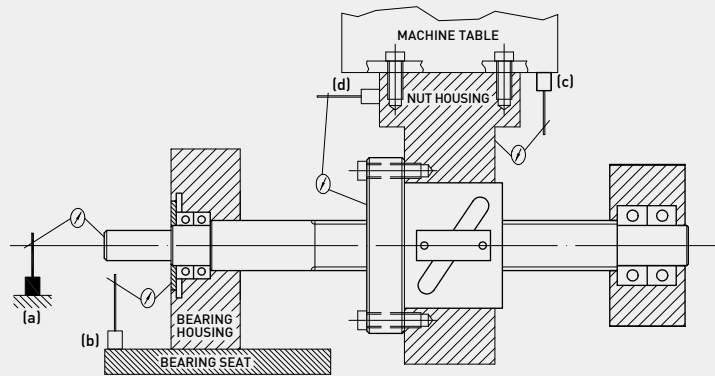


Fig. A-4 Locating the cause of an Abnormal Backlash

## B. Standard Housing Dimension Tolerance

Unit:  $\mu\text{m}=0.001\text{mm}$

Dimensional range (mm)	E		F			G		H						Js		J		K		M		N		P		R		Dimensional range (mm)		
	Over	Incl.	E10	E11	F6	F7	F8	G6	G7	H5	H6	H7	H8	H9	H10	Js6	Js7	J6	J7	K6	K7	M6	M7	N6	N7	P6	P7	R6	R7	Over
3		6	+68 +20	+95 +20	+18 +10	+22 +10	+28 +10	+12 +4	+16 +4	+5 0	+8 0	+12 0	+18 0	+30 0	+48 0	$\pm 4$	$\pm 6$	+5 -3	+6 -6	+2 -6	+3 -9	-1 -9	0 -12	-4 -16	-7 -17	-8 -20	-12 -20	-11 -23	3	6
6		10	+83 +25	+115 +25	+22 +13	+28 +13	+35 +5	+14 +5	+20 +5	+6 0	+9 0	+15 0	+22 0	+36 0	+58 0	$\pm 4.5$	$\pm 7.5$	+5 -4	+8 -7	+2 -7	+5 -10	-3 -12	0 -15	-4 -19	-12 -21	-9 -24	-16 -28	-13 -28	6	10
10		14	+102	+142	+27	+34	+43	+17	+24	+8	+11	+18	+27	+43	+70	$\pm 5.5$	$\pm 9$	+6 +10	+10 +10	+2 +6	+6 +6	-4 -4	0 0	-9 -5	-15 -11	-11 -11	-16 -16	-16 -16	10	14
14		18	+32	+32	+16	+16	+6	+6	+6	0	0	0	0	0	0	$\pm 6.5$	$\pm 10.5$	+8 +12	+12 +12	+2 +6	+6 +6	-4 -4	0 0	-11 -7	-18 -14	-29 -29	-31 -24	-24 -20	14	18
18		24	+124	+170	+33	+41	+53	+20	+29	+9	+13	+21	+33	+52	+84	$\pm 8$	$\pm 12.5$	+10 +14	+14 +14	+3 +7	+7 +7	-4 -4	0 0	-12 -8	-17 -17	-17 -17	-29 -42	-25 -45	30	40
24		30	+40	+40	+20	+20	+7	+7	+7	0	0	0	0	0	0	$\pm 9.5$	$\pm 15$	+13 +18	+18 +18	+4 +9	+9 +9	-5 -5	0 0	-14 -9	-26 -26	-26 -26	-45 -51	-37 -62	65	80
30		40	+150	+210	+41	+50	+64	+25	+34	+11	+16	+25	+39	+62	+100	$\pm 11$	$\pm 17.5$	+16 +22	+22 +22	+4 +10	+10 +10	-6 -6	0 0	-16 -10	-30 -30	-30 -30	-52 -59	-47 -76	100	120
40		50	+50	+50	+25	+25	+9	+9	+9	0	0	0	0	0	0	$\pm 12.5$	$\pm 20$	+18 +26	+26 +26	+4 +12	+12 +12	-8 -8	0 0	-20 -12	-36 -36	-36 -36	-68 -90	-53 -93	160	180
50		65	+180	+250	+49	+60	+76	+29	+40	+13	+19	+30	+46	+74	+120	$\pm 14.5$	$\pm 23$	+22 +30	+30 +30	+5 +13	+13 +13	-8 -8	0 0	-22 -14	-41 -41	-41 -41	-79 -109	-67 -113	200	250
65		80	+60	+60	+30	+30	+10	+10	+10	0	0	0	0	0	0	$\pm 17.5$	$\pm 25$	+16 +22	+22 +22	+4 +10	+10 +10	-6 -6	0 0	-38 -38	-45 -45	-45 -45	-69 -76	-45 -50	120	140
80		100														$\pm 20$	$\pm 27$	+18 +26	+26 +26	+4 +12	+12 +12	-8 -8	0 0	-45 -22	-61 -61	-61 -61	-90 -106	-63 -113	160	200
100		120	+212	+292	+58	+71	+90	+34	+47	+15	+22	+35	+54	+87	+140	$\pm 12.5$	$\pm 18$	+16 +22	+22 +22	+4 +10	+10 +10	-6 -6	0 0	-45 -38	-61 -61	-61 -61	-90 -106	-63 -113	120	140
120		140														$\pm 14.5$	$\pm 20$	+18 +26	+26 +26	+4 +12	+12 +12	-8 -8	0 0	-45 -22	-61 -61	-61 -61	-90 -106	-63 -113	140	160
140		160	+245	+335	+68	+83	+106	+39	+54	+18	+25	+40	+63	+100	+160	$\pm 12.5$	$\pm 18$	+18 +26	+26 +26	+4 +12	+12 +12	-8 -8	0 0	-45 -22	-61 -61	-61 -61	-90 -106	-63 -113	160	200
160		180	+85	+85	+43	+43	+14	+14	+14	0	0	0	0	0	0	$\pm 14.5$	$\pm 20$	+18 +26	+26 +26	+4 +12	+12 +12	-8 -8	0 0	-45 -22	-61 -61	-61 -61	-90 -106	-63 -113	180	225
180		200														$\pm 14.5$	$\pm 20$	+18 +26	+26 +26	+4 +12	+12 +12	-8 -8	0 0	-45 -22	-61 -61	-61 -61	-90 -106	-63 -113	200	250
200		225	+285	+390	+89	+96	+122	+44	+61	+20	+29	+46	+72	+115	+185	$\pm 14.5$	$\pm 20$	+18 +26	+26 +26	+4 +12	+12 +12	-8 -8	0 0	-45 -22	-61 -61	-61 -61	-90 -106	-63 -113	225	250
225		250	+100	+100	+50	+50	+15	+15	+15	0	0	0	0	0	0	$\pm 14.5$	$\pm 20$	+18 +26	+26 +26	+4 +12	+12 +12	-8 -8	0 0	-45 -22	-61 -61	-61 -61	-90 -106	-63 -113	225	250

Unit:  $\mu\text{m}=0.001\text{mm}$

# C. Standard Spindle Dimension Tolerance

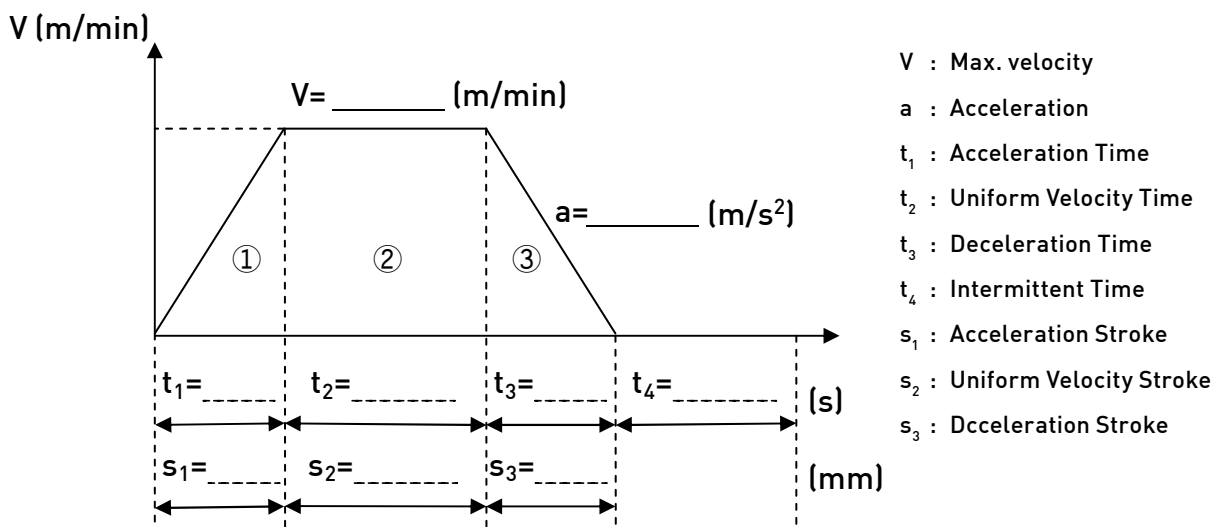
Dimensional range (mm)	a		c		d		e		f		g		h						js		j		k		m		n		p		r		Dimensional range (mm)	
	Incl.	a13	c12	d6	e6	f5	f6	g5	g6	h5	h6	h7	h8	h9	h10	js5	js6	j5	j6	k5	k6	m5	m6	n5	n6	p5	p6	r6	r7	Over	Incl.			
3	-270	-70	-30	-30	-20	-10	-10	-4	-4	0	0	0	0	0	0	$\pm 2.5$	$\pm 4$	+3	+6	+6	+9	+9	+12	+13	+16	+17	+20	+23	+27	3	6			
6	-450	-190	-38	-38	-28	-15	-18	-9	-12	-5	-8	-12	-18	-30	-48	$\pm 4$	$\pm 4.5$	-2	-2	+1	+1	+4	+4	+8	+8	+12	+12	+15	+15	6	10			
10	-280	-80	-40	-40	-25	-13	-13	-5	-5	0	0	0	0	0	0	$\pm 3$	$\pm 4.5$	+4	+7	+7	+10	+12	+15	+16	+19	+21	+24	+28	+34	10	14			
14	-500	-230	-49	-49	-34	-19	-22	-11	-14	-6	-9	-15	-22	-36	-58	$\pm 4$	$\pm 5.5$	-2	-2	+1	+1	+6	+6	+10	+10	+15	+15	+19	+19	14	18			
18	-290	-95	-50	-50	-32	-16	-16	-6	-6	0	0	0	0	0	0	$\pm 4$	$\pm 5.5$	+5	+8	+9	+12	+15	+18	+20	+23	+26	+29	+34	+41	14	18			
24	-560	-275	-61	-61	-43	-20	-27	-14	-17	-8	-11	-18	-27	-43	-70	$\pm 4.5$	$\pm 6.5$	-3	-3	+1	+1	+7	+7	+12	+12	+18	+18	+23	+23	18	24			
30	-300	-110	-65	-65	-40	-20	-20	-7	-7	0	0	0	0	0	0	$\pm 4.5$	$\pm 6.5$	+5	+9	+11	+15	+17	+21	+24	+28	+31	+35	+41	+49	24	30			
40	-630	-320	-78	-78	-53	-29	-33	-16	-20	-9	-13	-21	-33	-52	-84	$\pm 5.5$	$\pm 8$	-4	-4	+2	+2	+8	+8	+15	+15	+22	+22	+28	+28	30	40			
50	-310	-120	-80	-80	-50	-25	-25	-9	-9	0	0	0	0	0	0	$\pm 5.5$	$\pm 8$	+6	+11	+13	+18	+20	+25	+28	+33	+37	+42	+50	+59	40	50			
65	-700	-370	-96	-96	-66	-36	-41	-20	-25	-11	-16	-25	-39	-62	-100	$\pm 6.5$	$\pm 9.5$	-5	-5	+2	+2	+9	+9	+17	+17	+26	+26	+34	+34	40	50			
80	-320	-130	-100	-100	-70	-40	-45	-21	-26	-12	-17	-26	-40	-64	-104	$\pm 6.5$	$\pm 9.5$	+6	+12	+15	+21	+24	+30	+33	+39	+45	+51	+60	+60	50	65			
100	-800	-440	-119	-119	-85	-49	-54	-23	-29	-13	-19	-30	-46	-74	-120	$\pm 6.5$	$\pm 9.5$	-7	-7	+2	+2	+11	+11	+20	+20	+32	+32	+43	+43	65	80			
120	-360	-170	-120	-120	-90	-51	-58	-27	-34	-15	-22	-35	-54	-87	-140	$\pm 7.5$	$\pm 11$	+6	+13	+18	+25	+28	+35	+38	+45	+52	+59	+73	+73	80	100			
140	-920	-520	-142	-142	-94	-58	-64	-30	-38	-17	-25	-38	-58	-91	-150	$\pm 7.5$	$\pm 11$	-9	-9	+3	+3	+13	+13	+23	+23	+37	+37	+51	+51	100	120			
160	-410	-180	-142	-142	-94	-58	-64	-30	-38	-17	-25	-38	-58	-91	-150	$\pm 7.5$	$\pm 11$	+6	+13	+18	+25	+28	+35	+38	+45	+52	+59	+73	+73	100	120			
180	-950	-530	-170	-170	-110	-68	-74	-32	-40	-18	-26	-39	-60	-94	-160	$\pm 7.5$	$\pm 11$	-9	-9	+3	+3	+13	+13	+23	+23	+37	+37	+51	+51	100	120			
120	-460	-200	-120	-120	-90	-51	-58	-27	-34	-15	-22	-35	-54	-87	-140	$\pm 7.5$	$\pm 11$	+6	+13	+18	+25	+28	+35	+38	+45	+52	+59	+73	+73	120	140			
140	-1090	-600	-145	-145	-95	-61	-68	-32	-40	-18	-26	-39	-60	-94	-160	$\pm 9$	$\pm 12.5$	+7	+14	+21	+28	+33	+40	+45	+52	+61	+68	+88	+88	120	140			
160	-520	-210	-170	-170	-110	-68	-74	-32	-40	-18	-26	-39	-60	-94	-160	$\pm 9$	$\pm 12.5$	-11	-11	+3	+3	+15	+15	+27	+27	+43	+43	+63	+63	140	160			
160	-1150	-610	-170	-170	-110	-68	-74	-32	-40	-18	-26	-39	-60	-94	-160	$\pm 9$	$\pm 12.5$	-11	-11	+3	+3	+15	+15	+27	+27	+43	+43	+63	+63	140	160			
160	-580	-230	-170	-170	-110	-68	-74	-32	-40	-18	-26	-39	-60	-94	-160	$\pm 9$	$\pm 12.5$	-11	-11	+3	+3	+15	+15	+27	+27	+43	+43	+63	+63	140	160			
180	-1210	-630	-170	-170	-110	-68	-74	-32	-40	-18	-26	-39	-60	-94	-160	$\pm 9$	$\pm 12.5$	-11	-11	+3	+3	+15	+15	+27	+27	+43	+43	+63	+63	140	180			

## D. HIWIN Ballscrew Inquiry (1/2)

Company \_\_\_\_\_ Date \_\_\_\_ Day \_\_\_\_ Month \_\_\_\_ Year  
 Address \_\_\_\_\_  
 Telephone \_\_\_\_\_ Fax \_\_\_\_\_  
 Machine Type \_\_\_\_\_ Application  X axis  Y axis  Z axis  
 Guide way  Rolling  Sliding  Hardened slideway  
 Attached  Yes ( Drawing No. \_\_\_\_\_ )  No

### 1.Operation conditions:

Life Expectancy	_____ hr	Shock/Vibration	<input type="checkbox"/> Smooth
Lubricant	<input type="checkbox"/> Oil <input type="checkbox"/> Grease <input type="checkbox"/> Other _____		<input type="checkbox"/> Normal <input type="checkbox"/> Vibration
Environment	<input type="checkbox"/> General environment <input type="checkbox"/> High dust <input type="checkbox"/> Clean room <input type="checkbox"/> Other _____		
	<input type="checkbox"/> In vacuum (Value of Pressure _____ Torr/mmHg)		
	<input type="checkbox"/> High Temperature (Temperature _____ °C _____ °F)		



Operation conditions diagram

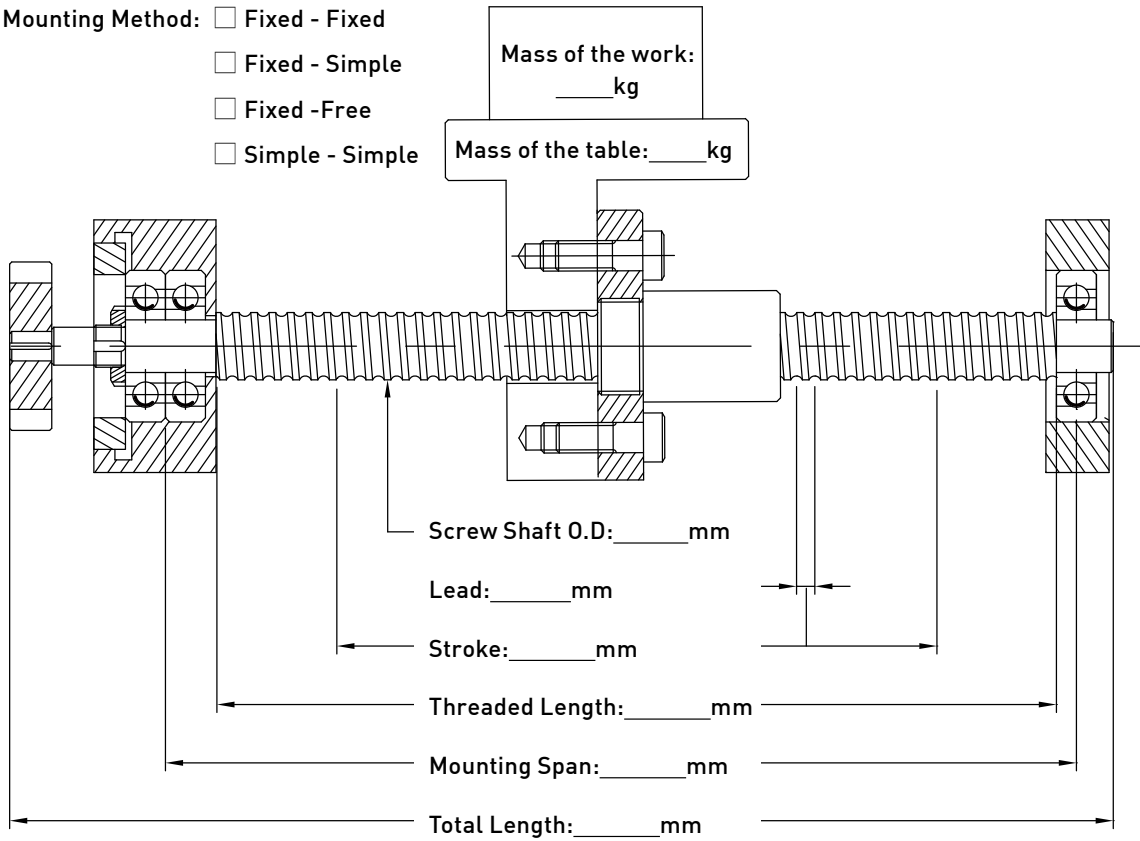
### 2. Specification factors of the ballscrew:

Operation Conditions	<input type="checkbox"/> Rotation Shaft <input type="checkbox"/> Rotation nut	Ballscrew Classification	<input type="checkbox"/> Rolled <input type="checkbox"/> Ground	Preload	_____ kgf
Turning Direction	<input type="checkbox"/> Right <input type="checkbox"/> Left	Accuracy Grade		Drag Torque	_____ kgf-cm
Seal	<input type="checkbox"/> Yes <input type="checkbox"/> No	Supplemental explanation		Support Bearing	<input type="checkbox"/> Ball _____ <input type="checkbox"/> Roller _____

## E. HIWIN Ballscrew Inquiry (2/2)

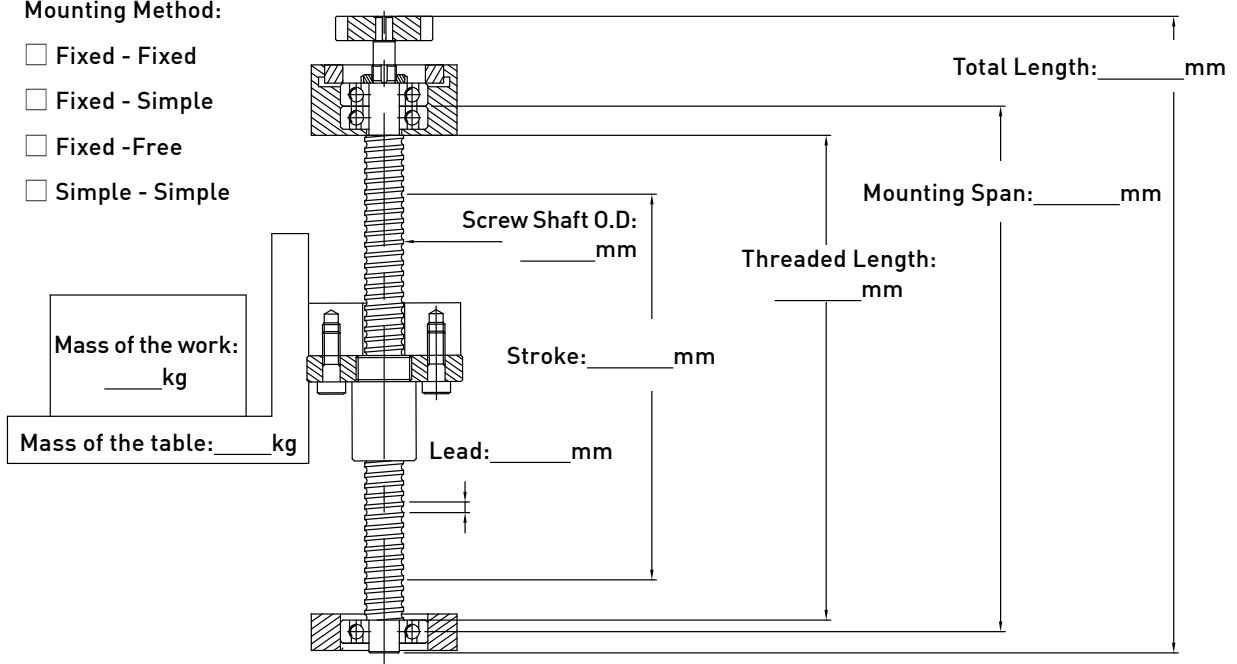
### 3. Horizontal Type:

- Mounting Method:  Fixed - Fixed  
 Fixed - Simple  
 Fixed -Free  
 Simple - Simple



### 4. Vertical Type:

- Mounting Method:  Fixed - Fixed  
 Fixed - Simple  
 Fixed -Free  
 Simple - Simple



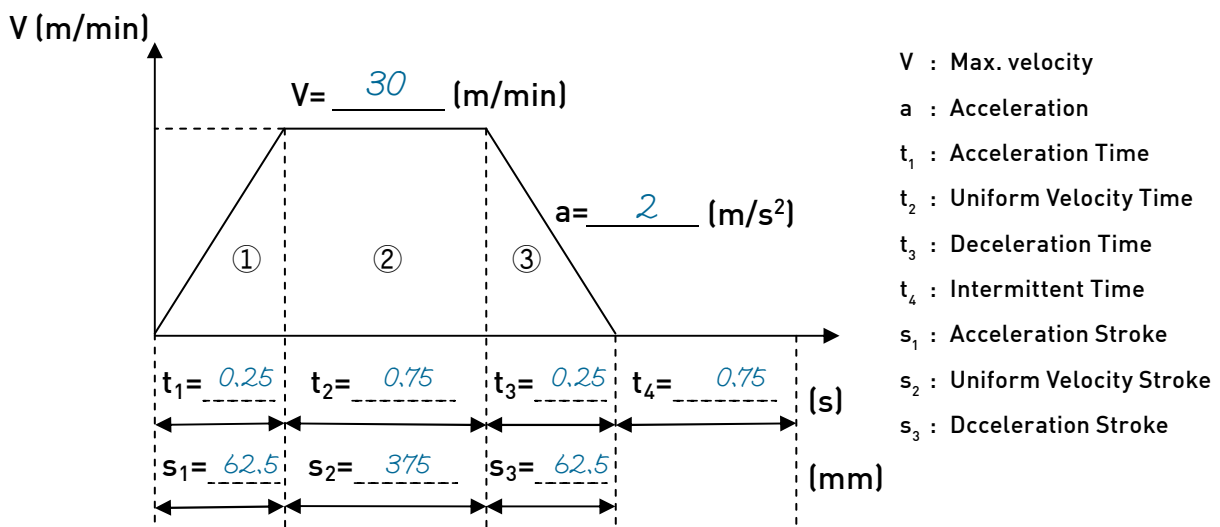


## F. HIWIN Ballscrew Inquiry Sample (1/2)

Company \_\_\_\_\_ Date \_\_\_\_ Day \_\_\_\_ Month \_\_\_\_ Year  
 Address \_\_\_\_\_  
 Telephone \_\_\_\_\_ Fax \_\_\_\_\_  
 Machine Type Three axis machine Application  X axis  Y axis  Z axis  
 Guide way  Rolling  Sliding  Hardened slideway  
 Attached  Yes ( Drawing No. \_\_\_\_\_ )  No

### 1. Operation conditions:

Life Expectancy	<u>20,000</u> hr	Shock/Vibration	<input type="checkbox"/> Smooth
Lubricant	<input checked="" type="checkbox"/> Oil <input type="checkbox"/> Grease <input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Normal <input type="checkbox"/> Vibration
Environment	<input checked="" type="checkbox"/> General environment <input type="checkbox"/> High dust <input type="checkbox"/> Clean room <input type="checkbox"/> Other _____ <input type="checkbox"/> In vacuum (Value of Pressure _____ Torr/mmHg) <input type="checkbox"/> High Temperature (Temperature _____ °C _____ °F)		



Operation conditions diagram

### 2. Specification factors of the ballscrew:

Operation Conditions	<input checked="" type="checkbox"/> Rotation Shaft <input type="checkbox"/> Rotation nut	Ballscrew Classification	<input type="checkbox"/> Rolled <input checked="" type="checkbox"/> Ground	Preload	<u>146</u> kgf
Turning Direction	<input checked="" type="checkbox"/> Right <input type="checkbox"/> Left	Accuracy Grade	<u>C3</u>	Drag Torque	_____ kgf-cm
Seal	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Support Bearing	Supplemental explanation	<input checked="" type="checkbox"/> Ball _____ <input type="checkbox"/> Roller _____	

## G. HIWIN Ballscrew Inquiry Sample (2/2)

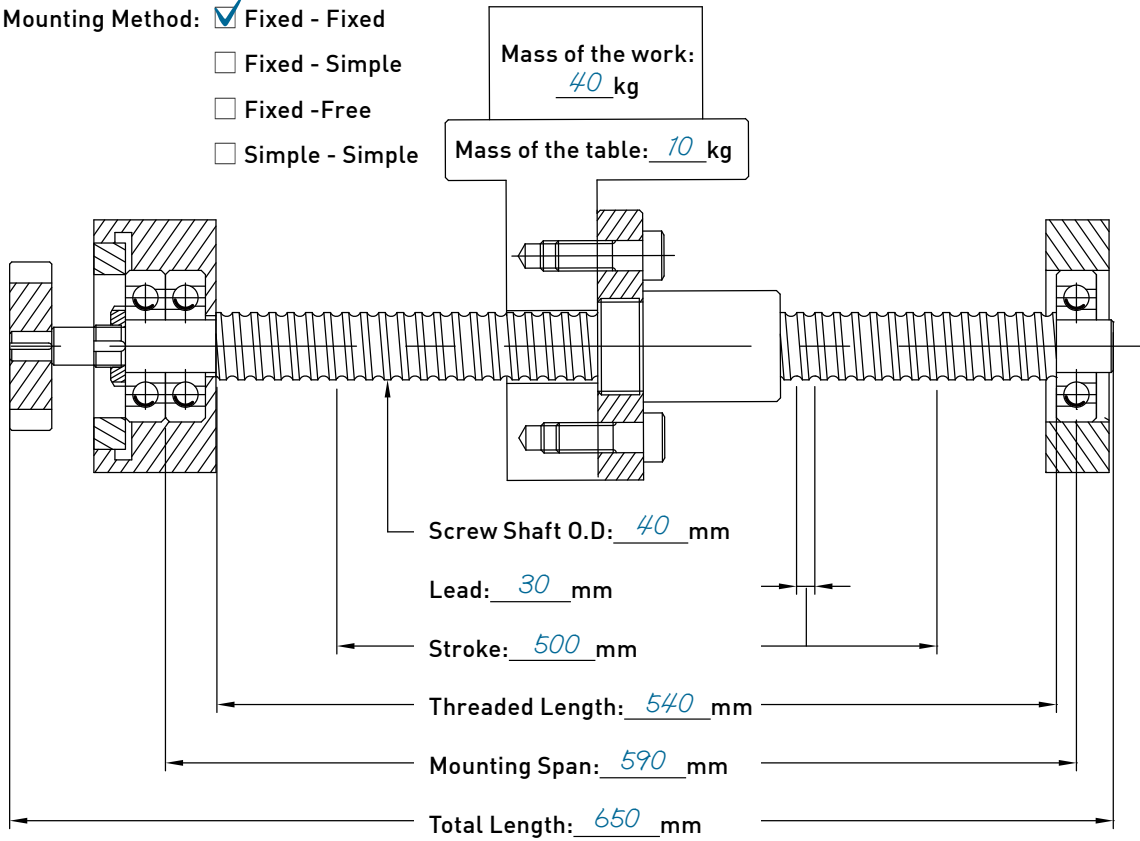
### 3. Horizontal Type:

Mounting Method:  Fixed - Fixed

Fixed - Simple

Fixed - Free

Simple - Simple



### 4. Vertical Type:

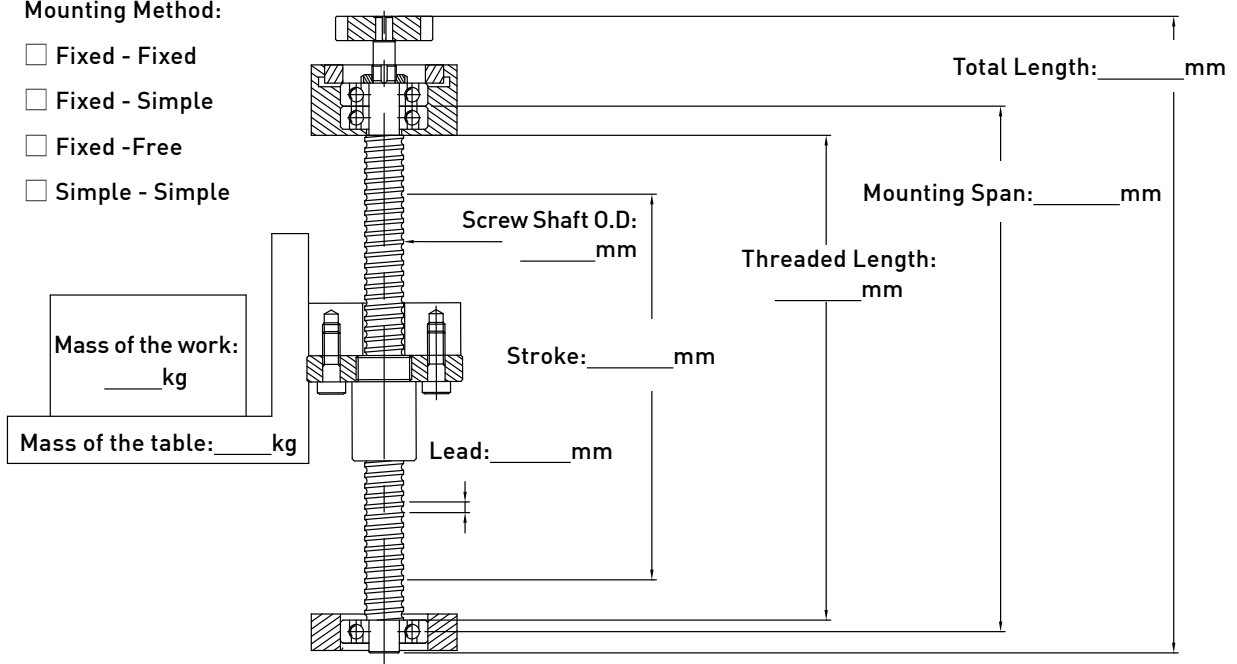
Mounting Method:

Fixed - Fixed

Fixed - Simple

Fixed - Free

Simple - Simple



## H. HIWIN Heavy Load Ballscrew Data Inquiry (1/2)

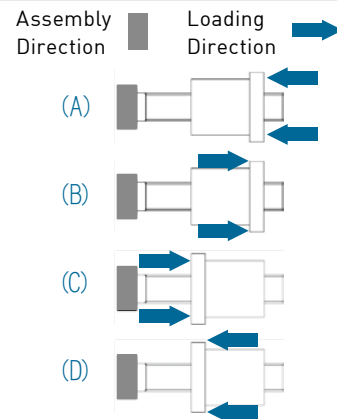
Company \_\_\_\_\_ Date \_\_\_\_ Day \_\_\_\_ Month \_\_\_\_ Year  
 Address \_\_\_\_\_  
 Telephone \_\_\_\_\_ Fax \_\_\_\_\_  
 Machine Type\* \_\_\_\_\_ Axis\* \_\_\_\_\_  
 Attached  Yes  No

※ For Injection or pressing machine, please provide the "ton" of machine.

※ For Injection machine, please provide the ballscrew is being used on injection, clamp or ejector.

### 1. Application Condition:

Movement Type:  Rotating shaft  Rotating nut  
 Mounting Method:  fix-fix  fix -support  fix -free  
 Installation:  Horizontal  Vertical  
 Loading Direction:  (A)  (B)  (C)  (D) (see the drawing)  
 Lubrication:  Grease  Oil  
 ※ Grease name: \_\_\_\_\_ Supplier: \_\_\_\_\_  
 Lubrication hole position:  HIWIN decide  special position  
 Spacer[Q1]:  Yes  No  
 Environment temperature: \_\_\_\_\_ °C



### 2. Ballscrew Specification:

Shaft diameter: \_\_\_\_\_ mm Turning direction:  Right  Left  
 Lead: \_\_\_\_\_ mm Start:  Single  Double  
 Nut type: \_\_\_\_\_ Circulation: \_\_\_\_\_ Axial backlash:  0.02MAX  0.05MAX  Other: \_\_\_\_\_  
 Thread Length: \_\_\_\_\_ mm Shaft Length: \_\_\_\_\_ mm

### 3. Loading Condition: (If there are more than one ballscrew used in the machine, please provide single ballscrew loading condition.)

Max. Dynamic Load: \_\_\_\_\_ kgf Max. Static Load: \_\_\_\_\_ kgf  
 Normal use stroke: \_\_\_\_\_ mm Max. stroke: \_\_\_\_\_ mm  
 Cycle time: \_\_\_\_\_ s Life requirement: \_\_\_\_\_ hours or cycles

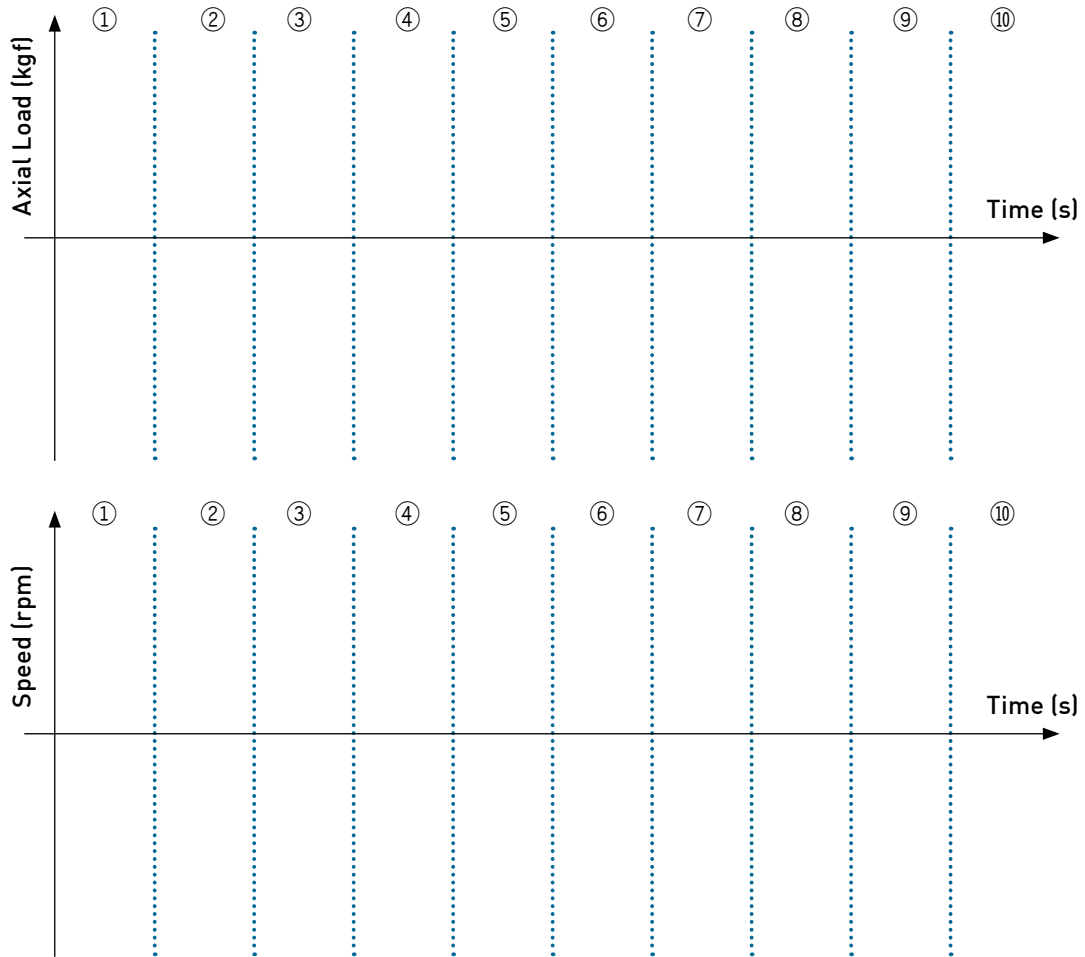
※ In order to make sure the ballscrew is suitable for your machine, please provide load conditions.

### 4. Other Remark:

# I. HIWIN Heavy Load Ballscrew Data Inquiry (2/2)

## 5. Loading curve drawing:

(If there is more than one ballscrew used in the machine, please provide single ballscrew loading conditions.)



	Axial Load (kgf)	Speed (rpm)	Time (s)	Distance (mm)	Remark
①					
②					
③					
④					
⑤					
⑥					
⑦					
⑧					
⑨					
⑩					

### Remark

- ※ Ballscrew' s actual life will be affected by assembly condition, lubrication and use condition.
- ※ Under high temperature the grease may not perform as it should.

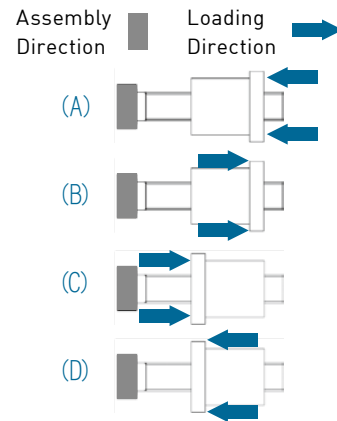
# J. HIWIN Heavy Load Ballscrew Data Inquiry Sample (1/2)

Company \_\_\_\_\_ Date \_\_\_\_ Day \_\_\_\_ Month \_\_\_\_ Year  
 Address \_\_\_\_\_  
 Telephone \_\_\_\_\_ Fax \_\_\_\_\_  
 Machine Type\* All electric injection molding machine [ 50ton] Axis\* clamping  
 Attached  Yes  No

※ For Injection or pressing machine, please notify the “ton” of machine.  
 ※ For Injection machine, please notify the ballscrew is being used on injection, clamp or ejector.

## 1. Application Condition:

Movement Type:  Rotating shaft  Rotating nut  
 Mounting Method:  fix-fix  fix -support  fix -free  
 Installation:  Horizontal  Vertical  
 Loading Direction:  (A)  (B)  (C)  (D) (see the drawing)  
 Lubrication:  Grease  Oil  
 ※ Grease name: HIWIN G01 Supplier: \_\_\_\_\_  
 Lubrication hole position:  HIWIN decide  special position  
 Spacer[Q1]:  Yes  No  
 Environment temperature: 50 °C



## 2. Ballscrew Specification:

Shaft diameter: 63 mm Turning direction:  Right  Left  
 Lead: 20 mm Start:  Single  Double  
 Nut type: FSS Circulation: 3.8x2 Axial backlash:  0.02MAX  0.05MAX  Other: \_\_\_\_\_  
 Thread Length: 1,000 mm Shaft Length: 1,500 mm

## 3. Loading Condition: (If there are more than one ballscrew used in the machine, please provide single ballscrew loading condition.)

Max. Dynamic Load: 8,000 kgf Max. Static Load: 2,500 kgf  
 Normal use stroke: 300 mm Max. stroke: 500 mm  
 Cycle time: 13 s Life requirement: 6,000,000 hours or cycles  
 ※ In order to make sure the ballscrew is suitable for your machine, please provide loading condition.

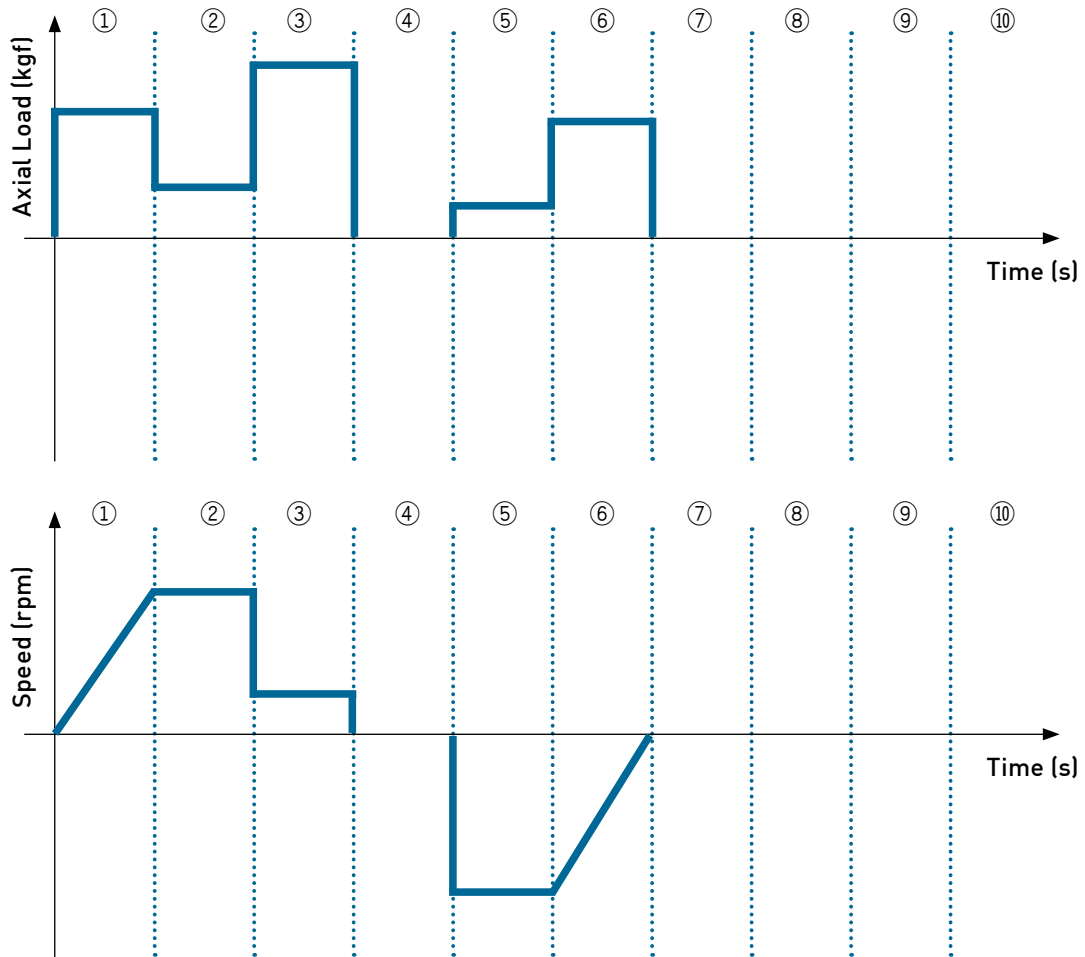
## 4. Other Remark:

\_\_\_\_\_

## K. HIWIN Heavy Load Ballscrew Data Inquiry Sample (2/2)

### 5. Loading curve drawing:

(If there is more than one ballscrew used in the machine, please provide single ballscrew loading condition.)



	Axial Load (kgf)	Speed (rpm)	Time (s)	Distance (mm)	Remark
①	2500	600	1	60	
②	400	1200	2	100	
③	8000	300	3	70	Instant peak load
④	0	0	4	0	
⑤	400	1200	2	100	
⑥	2500	600	1	60	
⑦					
⑧					
⑨					
⑩					

### Remark

- ※ Ballscrew' s actual life will be affected by assembly condition, lubrication and use condition.
- ※ Under high temperature the grease may not perform as it should.

## Ballscrews Technical Information

Publication Date : June 1998, first edition

Print Date : September 2016, 20th edition

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