DINGS'

Precision Motion Specialist

SCREW-NUT
PRODUCT CATALOG

Jiangsu DINGS' Intelligent Control Technology Co., Ltd.

Since it's establishment in 2008, Jiangsu DINGS' Intelligent Control Technology Co., Ltd adheres to the **"Quality comes from Responsibility, Details determine Success or Failure"** business concept, commits to become a Precision Motion Specialist and world-class motion control solutions provider.
DINGS' provides precision stepper motor actuators, brushless DC motors and motion controllers.

SIZE

DINGS' facility covers an area of 56 acres, with more than 5,000 square meters of processing center, equipped with more than 100 sets of processing equipment such as wire rolling machine, automatic injection molding machine, CNC machine tools, machining centers, automatic screw straightening machine, etc., with a total investment of more than 100 million in equipment; there are more than 20 motor assembly lines in the production workshop, with an annual production capacity of up to 4 million units; and there is a product research and development center, a precision testing and inspection laboratory and an experimental center.

It is equipped with testing and inspection instruments such as positioning torque test, hardness test, precision measurement, dynamic balance, etc. It has an integrated management system of product design, manufacturing and inspection, which provides the necessary conditions to meet the customized demands of users.



GROWTH

2008	Established a company and registered DINGS' Brand
2010	Established DINGS' MOTION USA
2016	Established DINGS' Korea
2019	Join in LEILI group
2021	Established Changzhou Intelligent Manufacturing Factory Listed on the new third board, NEEQ stock market
2022	Set up R&D Center in Korea
2023	Listed on the Beijing Stock Exchange [Stock Code : 873593] Conversion to DINGS' Korea Corporation Established of DINGS' Japan
2024	Relocation of Headquarter into new plant Established of DINGS' Motion Europe

QUALIFICATIONS

DINGS' is a high-tech company listed on the new third board, NEEQ stock market in June, 2021. And listed on the Beijing Stock Exchange 13th Apr, 2023. DINGS' has awards of "Jiangsu Private Science and Technology Enterprise", "Jiangsu Science and Technology Small and Medium-sized Enterprise" and "Jiangsu Specialized and New Small Giant Enterprise". In addition, DINGS' products have UL, RoHS, CE, REACH and other certifications as ISO9001, ISO14001 and ISO13485. DINGS' has more than 80 invention patents.

PRODUCT WARRANTY STATEMENT

DINGS' provides product quality certificates during shipping, and customers are to inspect product according to technical drawings and/or related requirements. DINGS's product warranty period is 2 years, calculated from delivery date, and customers are to refer to the product manual for proper storage and usage of the product. During the service life or warranty period, if our products are damaged or do not work properly due to quality problems, DINGS' provides no-charge repairs.

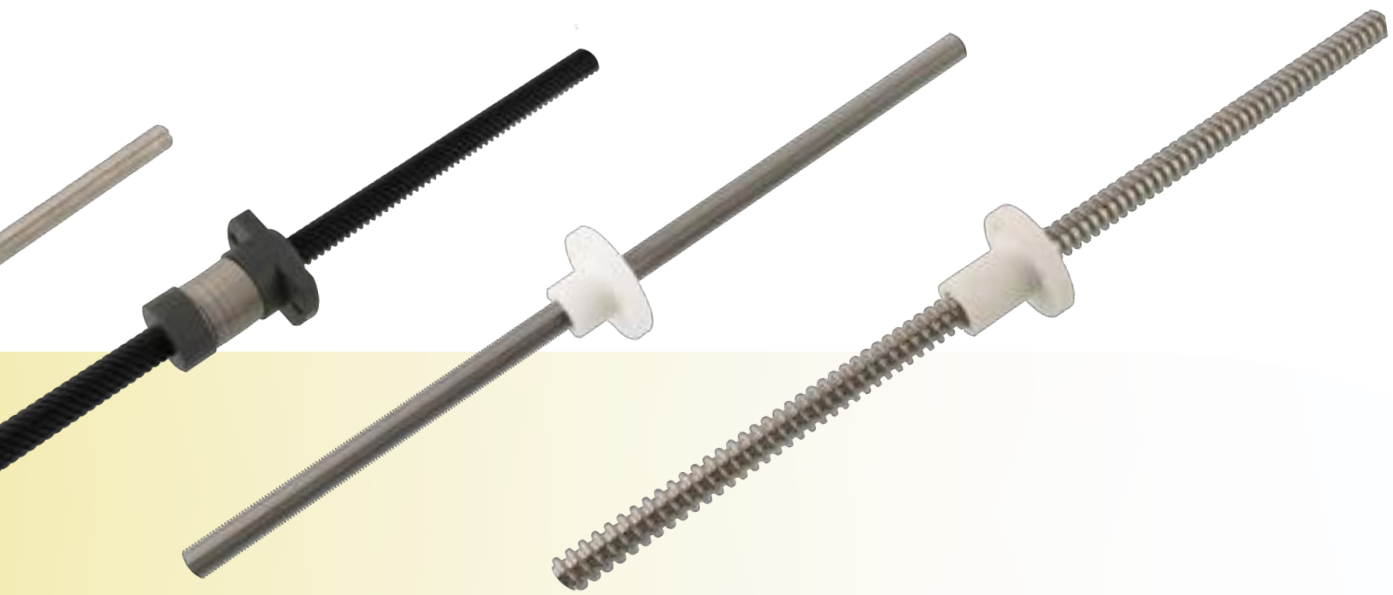
The following conditions do not belong to the scope of free maintenance :

- When the validity period has been exceeded
  (In the case of loss of nameplate or artificial damage, it is considered to have exceeded the validity period)
- Damage caused by improper usage
- Man-made dismantling
- Products that have been disassembled or repaired, but not by a DINGS' accredited representative
- Failure caused by irresistible factors such as natural disasters

Content

DINGS'
Precision Motion Specialist

SLIDING LEAD SCREW ASSEMBLY



Technical Introduction

DINGS' is continuously exploring and improving its Linear Actuator products with the goal of meeting customers' application requirements. DINGS' products are not ordinary screws and nuts. The design of screw threads takes into account the requirements of high precision, long life and low noise, and some special designs are made to increase the fluidity of the material when the screw is processed, which is very important for the screw. Finally, it is used with special material nuts of DINGS' to get the maximum economic value.

Lead Screw Material

DINGS' standard screw material is SUS303/316, we believe that to get a high quality screw, the material performance is the key. We strictly inspect the size and hardness of the material of each batch; customers can find that DINGS' screws are very stable and have good anti-corrosion properties, which can be applied to a variety of strict environments.

In order to get a more accurate thread, the key lies in the stability of the process such as: speed, vibration, temperature and precise control of the flow of coolant. Precision CNC tumblers ensure that the process is stable and adjustable.

CNC Straightening

Maximizing the straightness of the screw results in a smoother surface and longer product life. This process eliminates human error and minimizes vibration, noise and premature wear caused by axial play.

Excellent Lead Accuracy

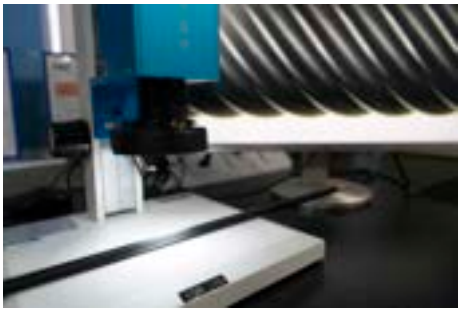
DINGS' has a dynamic lead accuracy measuring instrument, so that the lead accuracy already gets a stable detection in the manufacturing stage. Accuracy can be stably controlled within 0.07mm/300mm, 2 times higher than the industrial standard.

Quality Inspection

Thread surface is inspected using a high magnification optical device in the manufacturing and coating process.

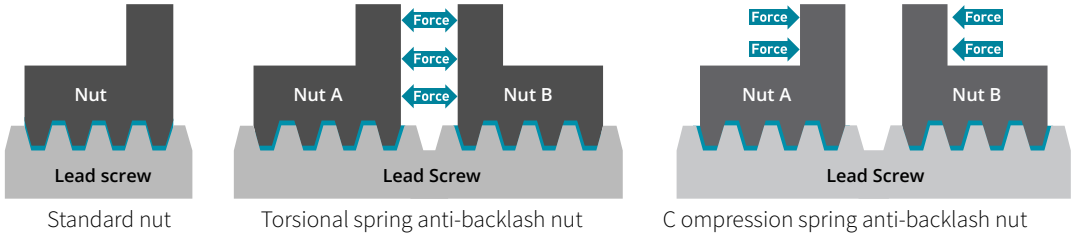
Teflon Coating Technology

Teflon coating technology, developed and processed in-house, reduces the friction coefficient on the surface of the screw, improving its efficiency and extending its service life. Every coated screw is inspected with an optical device to ensure that there is no flaking or unevenness in the layers

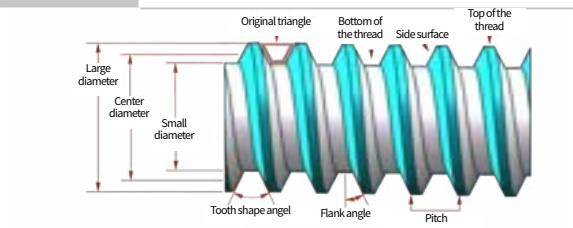


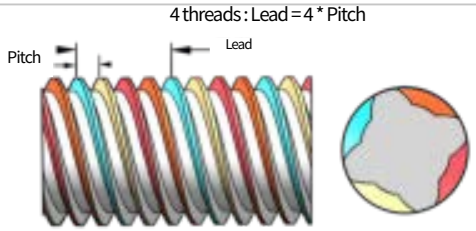
Terminology and Technical Parameters

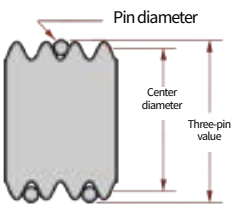
Backlash	Backlash (clearance) is the relative axial movement between a screw and a nut without rotating the screw or nut. Backlash increases with operating time. DINGS' has developed several unique methods to minimize or eliminate the clearance between a screw and a nut.
Center diameter	The center diameter is diameter of an imaginary cylindrical. The bushes of that cylinder pass through the threads with equal distances towards grooves and bosses. In an ideal product, each of these distances is equal to half of the pitch of the thread.
Helix angle	The helix angle is the angle formed by the pitch helix and the plane perpendicular to the axis.
Lead accuracy	Lead accuracy is the difference between the actual distance when traveling a lead and the theoretical lead.
Top of thread	Top of the thread.
Bottom of thread	Bottom of the thread.
Side surface	The side surface between the top and the bottom of thread.
Pitch	Pitch is the distance between the corresponding points on two adjacent threads parallel to the thread axis.
Lead	Lead is the axial distance the nut advances in one revolution of the screw. The lead is equal to the pitch multiplied by the number of thread heads. Pitch x number of heads = lead
Tooth shape angle	The flank angle is the angle between the side of the tooth and the vertical thread axis. The flank angle is sometimes referred to as the "half angle" of the thread, but this only applies when adjacent flanks have the same angle (i.e. when the thread is symmetrical).
Actual center diameter	The actual center diameter is determined by measuring the three-needle value and cotter angle in the projected profile perpendicular to the axis, and then calculating with the following formula. Three-needle value - needle diameter × (1 + 1 / sin flank angle) + 0.5 × pitch × cot flank angle = actual center diameter
Inner thread	Small diameters occur at the top of threaded teeth, while large diameters occur at the bottom of threaded teeth.
Outer thread	Small diameters occur at the bottom of threaded teeth, while large diameters occur at the top of threaded teeth.

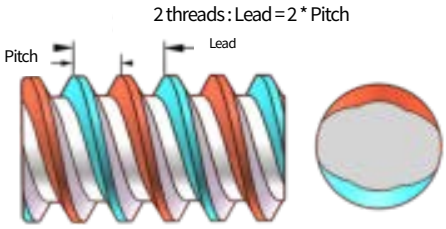


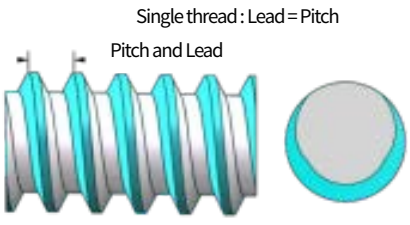
Standard nut | Torsional spring anti-backlash nut | C ompression spring anti-backlash nut



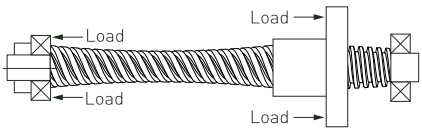
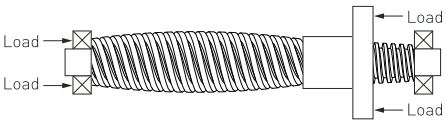
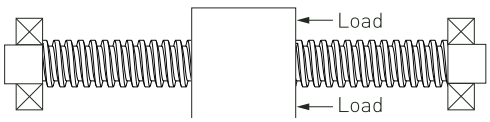
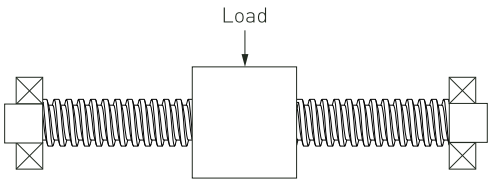








Terminology and Technical Parameters

Thread types	After more than 100 years of development, the ACME thread form replaced the square-threaded screw, which had straight sides and was difficult to manufacture and process, although it was mechanically efficient. There are three main types of ACME thread forms: universal, center and short trapezoidal. The general purpose and center type thread forms have a nominal thread depth of 0.50 x pitch and a thread angle of 29°. The trapezoidal thread form has a thread angle of 30°. High screw precision screw assemblies have an angle of 40°. Short trapezoidal threads follow the same basic design, but the thread depth is less than half the pitch. If the apex nut flank is subjected to radial loads, the large diameter of the screw will wedge into the large diameter of the nut when the nut thread flank contacts the screw thread flank. To prevent wedging, a smaller clearance and tighter tolerances are allowed between the nut's large diameter and the screw's large diameter. Note: Although lateral loads do not cause centering threads to wedge, the nut is still not suitable for lateral loads such as pulleys, drive belts, etc. Centering threads are manufactured to tighter tolerances and have less backlash on larger diameters than general purpose thread forms.
Static load	Maximum thrust load (including impact) applied to the non-moving nut assembly. The actual maximum static load may be reduced depending on the end mechanism and screw mounting hardware.
Dynamic load	The maximum recommended thrust load is applied to both the screw and the nut during movement.
PV load	Any material that carries sliding loads is limited by the heat rising caused by friction. Factors affecting the rate of heat generation during application are the pressure on the nut in kilograms per square centimeter of contact area and the surface sliding speed in meters per minute at large diameters. The product of these factors can be used to assess the superiority of the device.
Tension load	Load that tends to stretch the screw. 
Compression load	Load that tends to press the screw. 
Axial load	A load parallel to and concentric with the axis of the screw. 
Radial load	Radial load applied to the nut. 
Rollover load	Rotate the load along the longitudinal axis of the screw toward the radius.

Terminology and Technical Parameters

Screw and Stepper Motor Selection

The theoretical torque required to drive a load with a screw is :

$$\text{Driving torque} = \frac{\text{Load} * \text{Lead}}{2\pi * \text{screw efficiency}}$$

In order to properly use the above formula, the customer first needs to estimate the total axial load that must be driven by the screw system. The estimated total load should include all mass loads, acceleration loads, system friction loads and nut resistance loads. The frictional loads of the actuator or bearings and the rail system must also be considered - especially if flat bearings or bushings are used. In addition, moving parts and drag forces due to misalignment of the assembly need to be considered. Resistance Torque - Backlash nut assemblies are typically supplied with a resistance torque of 0.007Nm~0.049Nm. The amount of resistance torque depends on the standard shipment. The amount of drag torque depends on standard factory settings or customer specified settings. Generally, the higher the preset force, the better the backlash characteristics. See the Nut Details page for a description of its traction load.
Alternatively, the customer can create a table of estimated total loads at important application speeds and use the above formula to estimate the theoretical value of motor torque for each combination of screw diameter and lead wanted.
After estimating the required motor torque and determining the speed of the application, the customer can review the torque-speed graphs in the DINGS' Product Catalog and User's Guide to determine the specifications of the motor to be selected. Note that it is usually necessary to ensure that the stepper motor produces 1.5 to 2 times the thrust at all speeds at which it is operating. The 1.5 to 2 multiplier helps to compensate for variations in motor torque, friction, small misalignments, cable tray resistance, and other factors that were not taken into account when estimating the total load.

Reverse Drive of the Screw

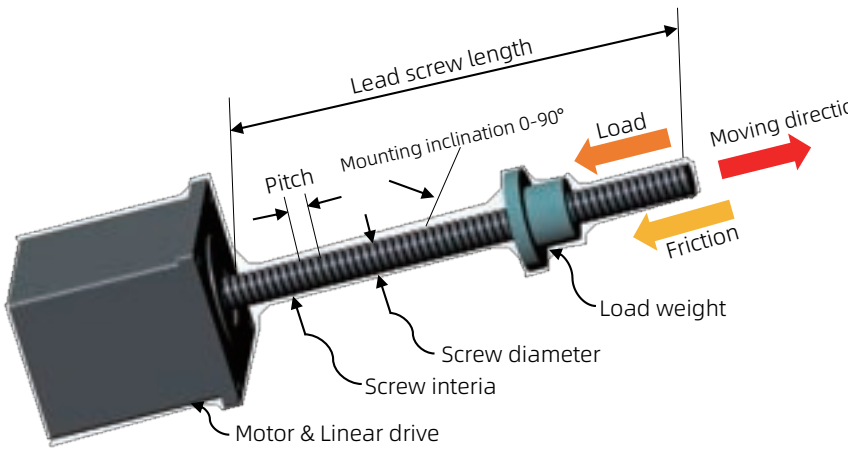
If the efficiency of the screw and nut is high enough, the screw can be driven in reverse when axial thrust is applied to the nut. Generally, reverse drive does not occur when the lead of the screw is less than 1/3 the diameter of an uncoated screw or 1/4 the diameter of a coated screw. Applying a lubricant to the screw reduces the coefficient of friction of the screw & nut system and gives it the ability to reverse drive. A vibrating nut system will reverse drive less efficiently than a comparable nut system that does not vibrate.

The theoretical braking torque required to hold the load is :

$$\text{Holding torque} = \frac{\text{Load} * \text{Lead} * \text{Lead screw efficiency}}{2\pi}$$

Other Systemic Factors

The customer should also check that the 80% critical speed limit of the screw, the maximum compression column load of the screw and the PV derated nut load capacity do not exceed the charts on the following pages. Standard operating temperature range is 32° -180°F (0-82°C)

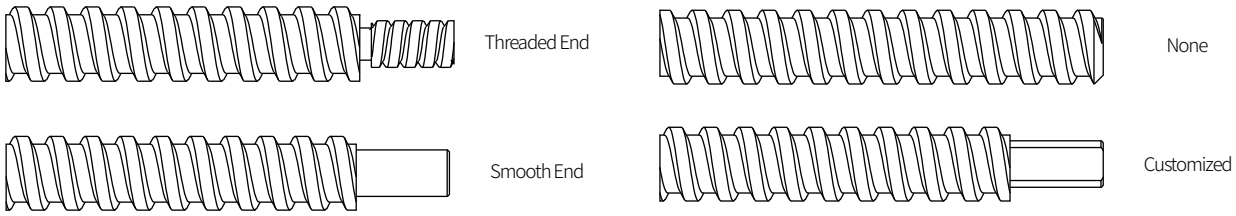


DINGS' lead screw, nut and hybrid linear actuator

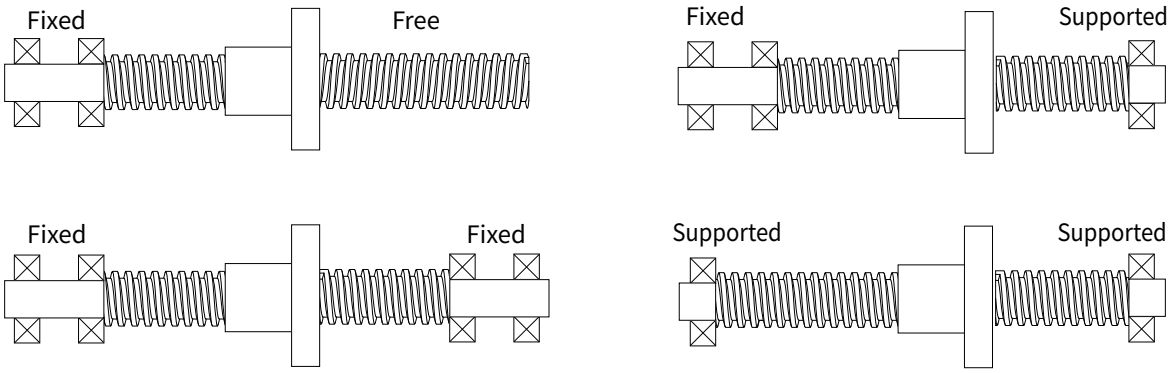
Lead Screw Components

End Machining

Select the end machining specification according to the actual size of the outer diameter of the screw, and contact our technical support engineers for confirmation.



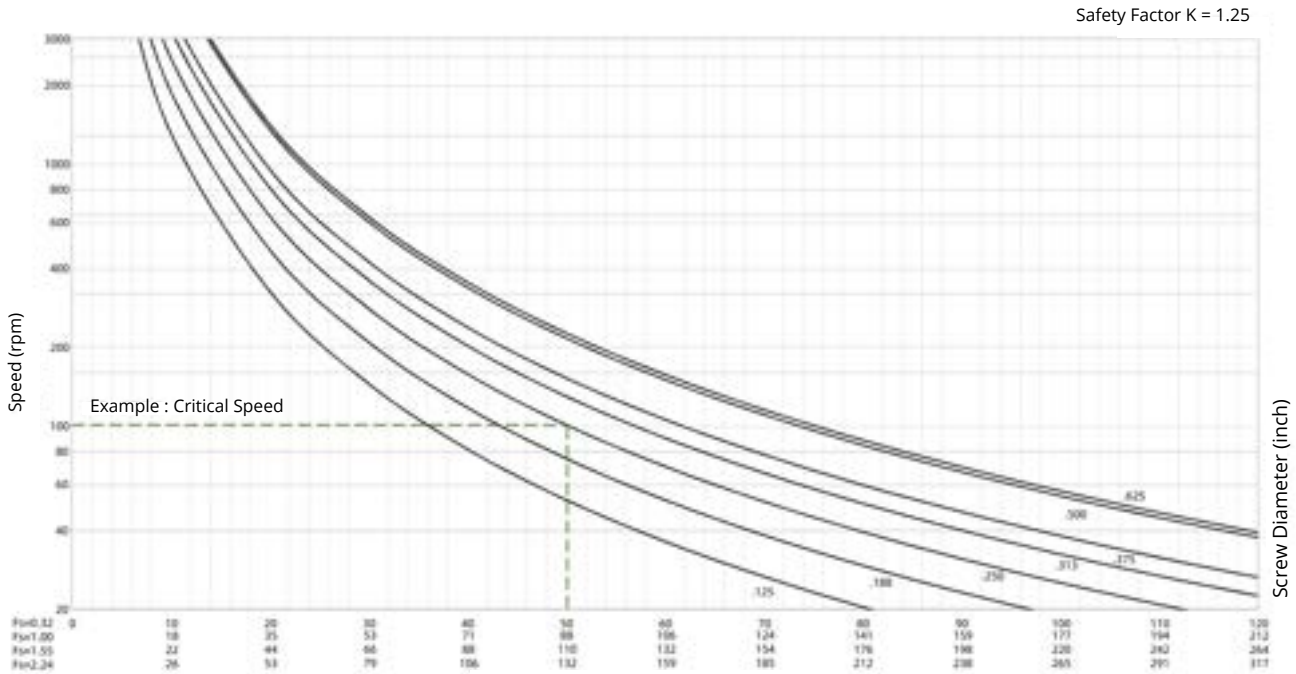
Type of End Fixity



Critical Speed of the Screw

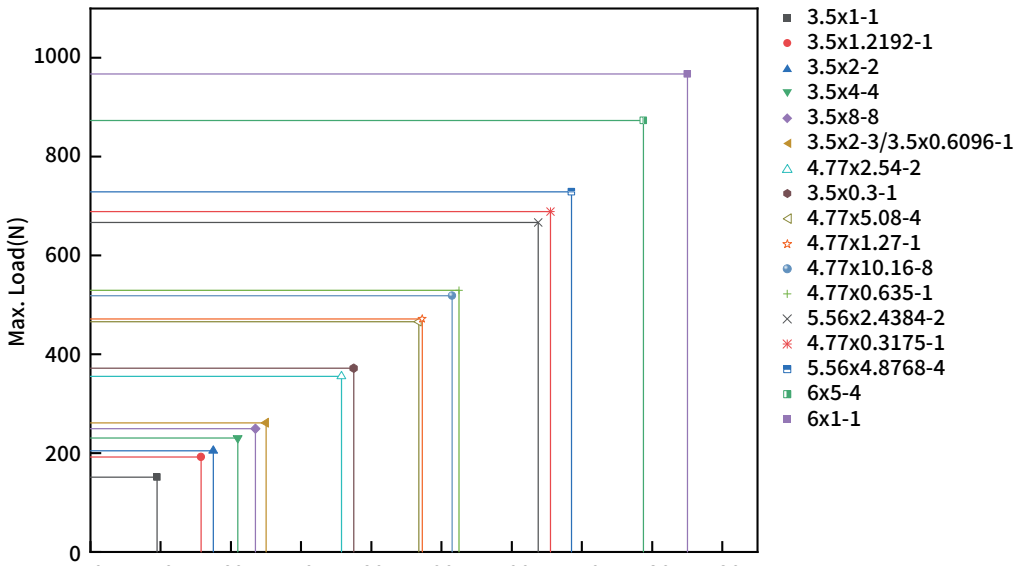
When customers use this chart, they need to determine the fixing method and linear speed of the screw ends, and then calculate the rotational speed based on the lead of the screw.

Note: The speed of the screw should be less than 80% of the critical speed.



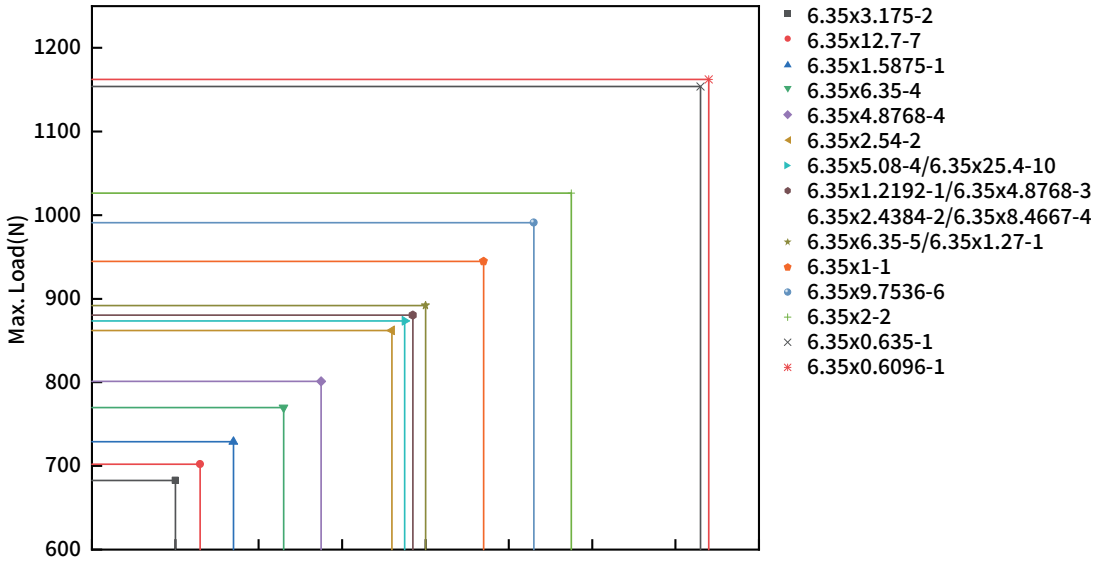
Critical Load of the Screw

To use this chart: first confirm the fixing method by locating the point where the maximum length between the bearing support and the sliding nut intersects the maximum load, and then ensure that the selected screws are located above and to the right of this point.



Fixed-free	40	50	60	70	80	90	100	110	120	130
Supported-supported	80	100	120	140	160	180	200	220	240	260
Fixed-supported	113	141	170	198	226	255	283	311	339	368
Fixed-fixed	160	200	240	280	320	360	400	440	480	520

Max. length between bearings (mm)



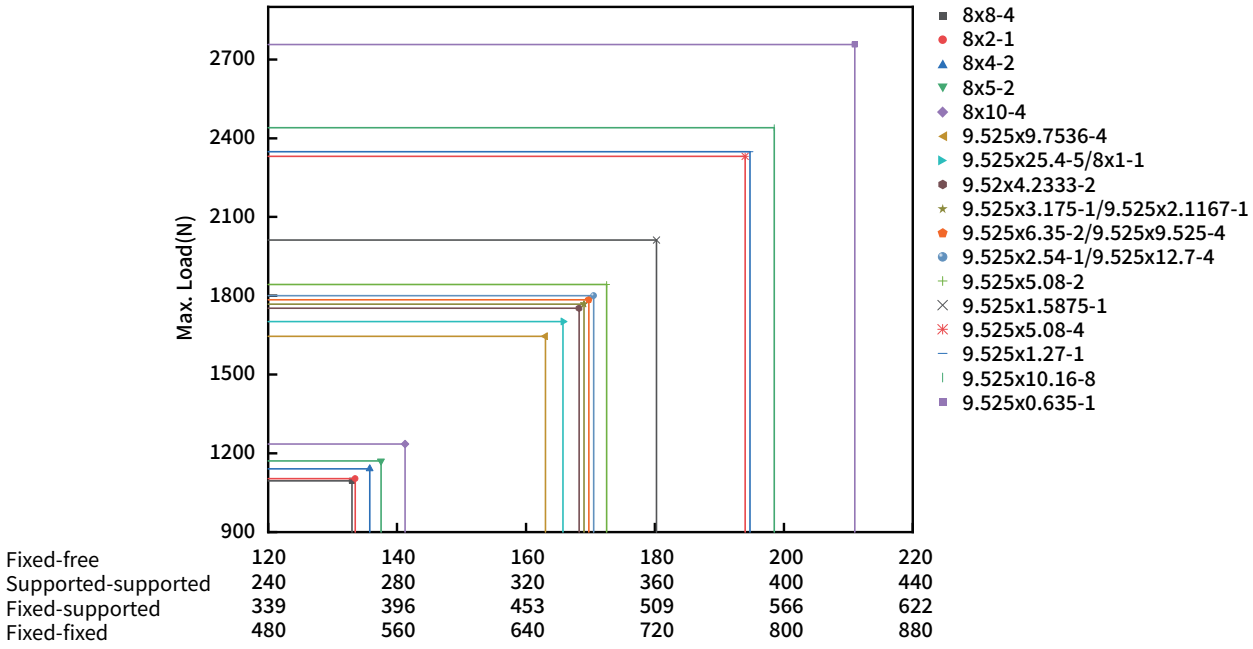
Fixed-free	100	105	110	115	120	125	130	135	140
Supported-supported	200	210	220	230	240	250	260	270	280
Fixed-supported	283	297	311	325	339	354	368	382	396
Fixed-fixed	400	420	440	460	480	500	520	540	560

Max. length between bearings (mm)

Lead Screw Components

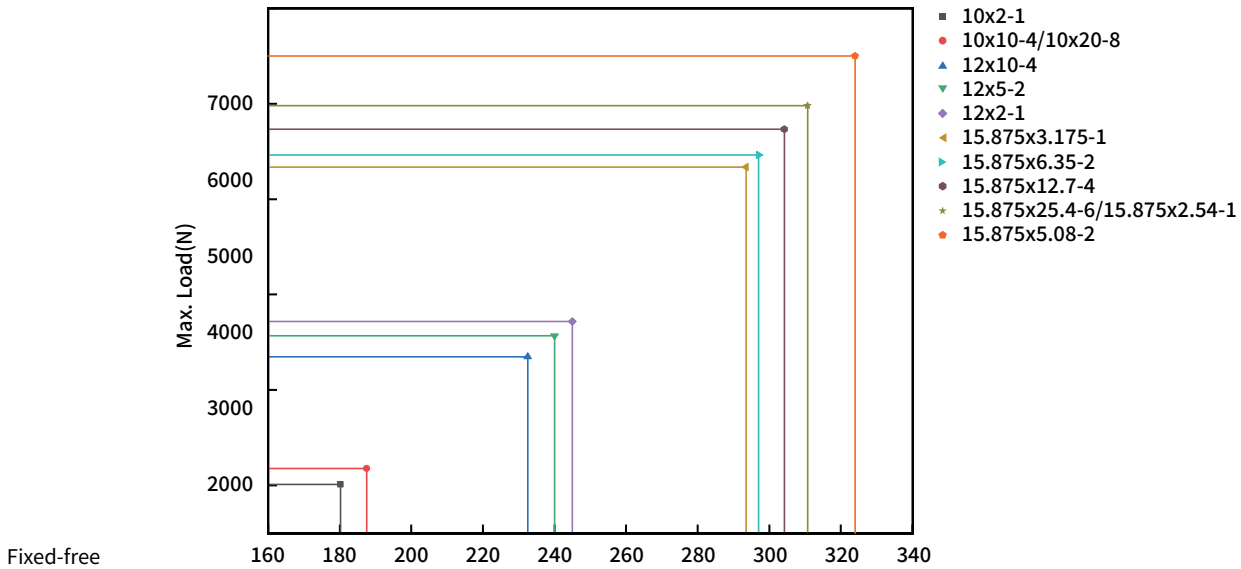
Critical Load of the Screw

To use this chart, first confirm the fixing method by locating the point where the maximum length between the bearing support and the sliding nut intersects the maximum load, and then ensure that the selected screws are located above and to the right of this point.



Fixed-free	120	140	160	180	200	220
Supported-supported	240	280	320	360	400	440
Fixed-supported	339	396	453	509	566	622
Fixed-fixed	480	560	640	720	800	880

Max. length between bearings (mm)



Fixed-free	160	180	200	220	240	260	280	300	320	340
Supported-supported	320	360	400	440	480	520	560	600	640	680
Fixed-supported	453	509	566	622	679	735	792	849	905	962
Fixed-fixed	640	720	800	880	960	1040	1120	1200	1280	1360

Max. length between bearings (mm)

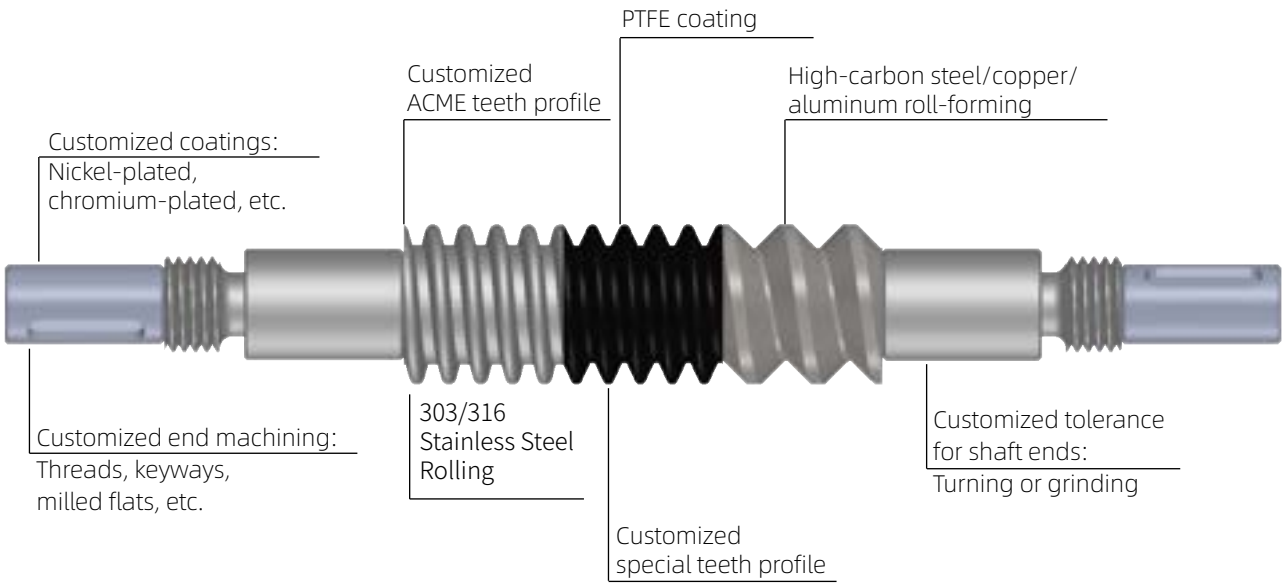
Customized Screw Assembly

Customized Nuts

DINGS' can machine nuts from a wide range of high performance engineered materials such as polyacetal, polyamide, polyphenylene sulfide, polyester or custom engineered polymers including fillers, PTFE, carbon fibers, aramid fibers, glass fibers, etc. In your R&D phase we can provide you with rapid prototyping through machining or 3D printing. In the mass production phase, if you have significant cost and design constraints, then our engineers can help you to reduce costs and optimize your design by opening molds.

Customized Screws

DINGS' manufactures world-class precision screws. Over the years, we have continuously optimized our screw design and rolling process, and we also have the ability to grind and turn screws, all in order to satisfy our customers' requirements. We have customized hundreds of non-standard screws in sizes that are not in our catalog, and we are experts in rolled screws in non-standard materials such as aluminum, copper, high carbon steel, 300 and 400 series stainless steel, etc.



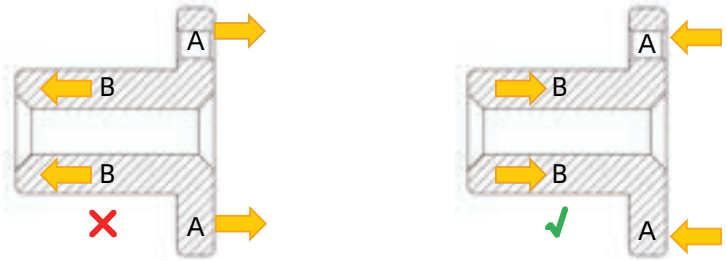
Installation and Maintenance of Sliding Lead Screws

Mounting Screws

The screw must be carefully aligned with the aid of a measuring tool to ensure that the axis is horizontal or vertical. If no measuring tool is available, rotate the screw manually over its entire length before installing the drive unit. Unevenness of force or traces of movement on the outer diameter of the screw may result in axial deviation between the screw shaft and the guide element. In this case the corresponding fixing bolts should be loosened and the screw manually rotated again until the strength is even.

Mounting Nuts

The installation of the nut usually requires attention to coincide with the axis of the screw and is usually commissioned using the same method as for the installation of the screw. It should also be noted that the direction of the load should not attempt to separate flange A from cylinder B, as this is detrimental to the strength of the mechanism.



Lubrication

1. **Lubricating oil** : Not commonly used, special cases only (e.g. strict costs, short-term use, inability to get the right grease fast enough)
2. **Grease** : The lubrication method in common cases, will generally give a long service life. It is recommended to clean the screws before lubrication.
3. Type of grease: Bearing grease without solid lubricant or with very fine solid lubricant.

Operating Temperature

Depends on the nut material used, lubrication conditions and operating conditions. For temperatures above 100°C, please consult our engineers.

Wear and Maintenance

The lubricating frequency of the screws depend on the operating conditions :

1. Smaller loads and speeds and proper installation are generally associated with a longer service life, which is usually maintenance-free, as we simply wait for the nut to reach the end of its service life and then replace it.
2. Moderate loads and speeds usually require periodic inspection of the condition of the screw and nut. We recommend annual maintenance to remove dust from the surface of the screw and then re-grease the screw, which will prolong its service life.
3. For higher loads and speeds, we recommend that the screws be maintained every three months by cleaning the surface of the screws of dust and replenishing the grease.
4. During maintenance, the screw needs to be rotated manually, if the backlash exceeds the customer's ideal value, then the nut needs to be replaced. If the customer has no requirements for backlash, then according to DINGS' standard, the nut must be replaced when the backlash exceeds 1/3 of the pitch.

Service

We can carry out professional repair work on screws within a short period of time, either at DINGS' or at the customer's premises. This service is also available for third party products. If DINGS' has the standardized product, it can be obtained within a very short period of time.

Lead Screw Dimension Table

Standard Dia.		Dia. Code	Lead		Lead Code	Outer Dia. (Reference)		Bottom Dia. (Reference)		Corresponding to Left-Handed Thread	Efficiency %
Imperial (inch)	Metric (mm)		Imperial (inch)	Metric (mm)		Imperial (inch)	Metric (mm)	Imperial (inch)	Metric (mm)		
0.098	2.5	009	0.0394	1	AB	0.0976	2.48	0.078	1.98	-	55
0.1181	3	012	0.0197	0.5	AD	0.1169	2.97	0.0933	2.37	-	42
9/64	3.5	014	0.0118	0.3	AF	0.137	3.48	0.1213	3.08	-	24
			0.024	0.6096	AA	0.1358	3.45	0.102	2.59	-	40
			0.0394	1	AB	0.1283	3.26	0.078	1.98	-	58
			0.048	1.2192	B	0.1366	3.47	0.0878	2.23	-	61
			0.0787	2	G	0.137	3.48	0.0874	2.22	yes	72
			0.096	2.4384	J	0.1339	3.4	0.1102	2.8	-	75
			0.1575	4	M	0.1366	3.47	0.0961	2.44	-	79
			0.315	8	T	0.1366	3.47	0.1	2.54	-	81
3/16	4.77	018	0.0125	0.3175	AL	0.1882	4.78	0.1661	4.22	-	21
			0.025	0.635	A	0.1874	4.76	0.1457	3.7	-	33
			0.05	1.27	D	0.1882	4.78	0.1374	3.49	yes	58
			0.0625	1.5875	F	0.1878	4.77	0.1563	3.97	-	60
			0.1	2.54	K	0.1882	4.78	0.1193	3.03	-	69
			0.1874	4.76	AC	0.187	4.75	0.1646	4.18	-	78
			0.192	4.8768	Q	0.1878	4.77	0.1378	3.5	-	79
			0.2	5.08	R	0.1874	4.76	0.1366	3.47	-	80
			0.4	10.16	X	0.1874	4.76	0.1441	3.66	-	82
0.24	6	024	0.0394	1	AB	0.2354	5.98	0.1961	4.98	-	40
			0.0787	2	G	0.2303	5.85	0.1752	4.45	-	59
			0.1969	5	E	0.2354	5.98	0.1862	4.73	-	76
1/4	6.35	025	0.024	0.6096	AA	0.2492	6.33	0.2157	5.48	-	26
			0.025	0.635	A	0.25	6.35	0.215	5.46	-	27
			0.0313	0.794	N	0.2492	6.33	0.2106	5.35	-	32
			0.0394	1	AB	0.25	6.35	0.1945	4.94	-	37
			0.048	1.2192	B	0.2492	6.33	0.1878	4.77	-	45
			0.05	1.27	D	0.2492	6.33	0.1894	4.81	-	46
			0.0625	1.5875	F	0.2469	6.27	0.1894	4.81	yes	46
			0.096	2.4384	J	0.2496	6.34	0.1886	4.79	-	61
			0.1	2.54	K	0.2488	6.32	0.1886	4.79	yes	62
			0.125	3.175	L	0.2488	6.32	0.1669	4.24	-	67
			0.192	4.8768	Q	0.2492	6.33	0.1791	4.55	-	76
			0.2	5.08	R	0.2496	6.34	0.187	4.75	-	76
			0.25	6.35	S	0.2488	6.32	0.189	4.8	-	76
			0.25	6.35	S	0.2488	6.32	0.1756	4.46	-	78
			0.3333	8.4667	U	0.2492	6.33	0.1886	4.79	-	78
			0.384	9.7536	W	0.2492	6.33	0.1992	5.06	-	78
			0.5	12.7	Y	0.248	6.3	0.1677	4.26	-	82
			1	25.4	Z	0.2496	6.34	0.187	4.75	-	84

Lead Screw Dimension Table

Standard Dia.		Dia. Code	Lead		Lead Code	Outer Dia. (Reference)		Bottom Dia. (Reference)		Corresponding to Left-Handed Thread	Efficiency %
Imperial (inch)	Metric (mm)		Imperial (inch)	Metric (mm)		Imperial (inch)	Metric (mm)	Imperial (inch)	Metric (mm)		
0.315	8	032	0.0394	1	AB	0.3118	7.92	0.2638	6.7	-	34
			0.0787	2	G	0.3122	7.93	0.2102	5.34	-	53
			0.1575	4	M	0.3146	7.99	0.2138	5.43	-	68
			0.1969	5	E	0.3142	7.98	0.2165	5.5	-	73
			0.315	8	T	0.3209	8.15	0.2087	5.3	-	80
			0.3937	10	C	0.3142	7.98	0.2165	5.5	-	82
3/8	9.525	037	0.025	0.635	A	0.374	9.5	0.3323	8.44	-	19
			0.05	1.27	D	0.374	9.5	0.3067	7.79	-	36
			0.0625	1.5875	F	0.3732	9.48	0.2839	7.21	-	41
			0.0833	2.1167	H	0.3728	9.47	0.2673	6.79	-	48
			0.1	2.54	K	0.3732	9.48	0.2677	6.8	yes	53
			0.125	3.175	L	0.3728	9.47	0.2657	6.75	-	59
			0.1667	4.2333	P	0.3728	9.47	0.265	6.73	-	61
			0.2	5.08	R	0.3736	9.49	0.2717	6.9	-	68
			0.25	6.35	S	0.3728	9.47	0.2665	6.77	-	71
			0.375	9.525	V	0.3736	9.49	0.2673	6.79	-	77
			0.384	9.7536	W	0.3732	9.48	0.2567	6.52	-	77
			0.4	10.16	X	0.372	9.45	0.3126	7.94	-	78
			0.5	12.7	Y	0.374	9.5	0.2685	6.82	-	80
			1	25.4	Z	0.3732	9.48	0.261	6.63	-	84
0.394	10	039	0.0787	2	G	0.3902	9.91	0.2839	7.21	-	47
			0.3937	10	C	0.3929	9.98	0.2953	7.5	-	79
			0.7874	20	I	0.3929	9.98	0.2953	7.5	-	82
0.47	12	047	0.0787	2	G	0.4717	11.98	0.3858	9.8	-	39
			0.1965	5	E	0.4717	11.98	0.378	9.6	-	60
			0.3937	10	C	0.4717	11.98	0.3661	9.3	-	73
			0.5906	15	CE	0.4717	11.98	0.3591	9.12	-	78
			0.9843	25	IE	0.4717	11.98	0.3543	9	-	80
0.5	12.7	050	1	25.4	Z	0.4902	12.45	0.3709	9.42	-	84
0.625	15.875	062	0.1	2.54	K	0.6228	15.82	0.4886	12.41	-	40
			0.125	3.175	L	0.6236	15.84	0.4622	11.74	-	47
			0.2	5.08	R	0.6205	15.76	0.5102	12.96	-	58
			0.25	6.35	S	0.622	15.8	0.4677	11.88	-	63
			0.5	12.7	Y	0.6217	15.79	0.4791	12.17	-	74
			1	25.4	Z	0.6228	15.82	0.4894	12.43	-	80

CS Circular flange standard Nut

Part Number Construction

Example L CS M1 G R -014AB 0150.00 N -001
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Lead Screw Type
L = Sliding Screw

② Nut Model
S = Without Nut
CS = Circular flange standard nut
CTS = Circular flange trimming standard nut
CTC = Circular flange trimming compression spring anti-backlash nut
CTA = Circular flange trimming torsion spring anti-backlash nut A
TTA = Triangle flange torsion spring anti-backlash nut A
TTB = Triangle flange torsion spring anti-backlash nut B
TC = Triangle flange compression spring anti-backlash nut
NS = Non-standard customization nut

③ Nut Material
M1 = POM
M2 = PBT
M3 = PPS
M4 = Bronze

④ Screw Surface Treatment
G = Standard lubrication grease
T = PTFE coating
S = No oil, No coating
D = Non-standard customization

⑤ Thread Direction
R = Right hand thread
L = Left hand thread
C = Non-standard customization

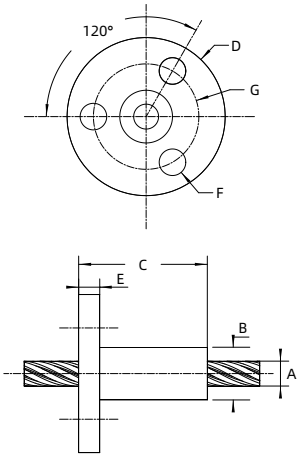
⑥ Lead Screw Specification
014 = Diameter code
AB = Lead code
(Refer to the lead screw dimension table for details)

⑦ Lead Screw Length
Metric (mm) : 0000

⑧ End Type
M = Metric thread
S = Smooth shaft
B = Non-standard customization
N = No machining

⑨ Customization Serial Number

Mechanical Dimension



Material	Operating Temperature
POM	5°C - 80°C (41°F - 176°F)
PBT	-40°C - 120°C (-40°F - 248°F)
PPS	-40°C - 220°C (-40°F - 428°F)

Lead Screw Diameter (A) mm (inch)	3.5 (9/64)	4.77 (3/16)	6 (0.24)	6.35 (1/4)	8 (0.315)	9.5 (3/8)	10 (0.394)	12 (0.47)	15.8 (0.625)
Nut Diameter (B) mm (inch)	6.35 (0.25)	8 (0.31)	12 (0.47)	12 (0.47)	12 (0.47)	15.88 (0.63)	15.88 (0.63)	22 (0.866)	28.6 (1.13)
Nut Length (C) mm (inch)	15.5 (0.61)	9.5 (0.37)	13.4 (0.52)	13.4 (0.52)	13.4 (0.52)	25.4 (1)	25.4 (1)	30 (1.181)	31.7 (1.25)
Flange Diameter (D) mm (inch)	19.05 (0.75)	19.05 (0.75)	25.4 (1)	25.4 (1)	25.4 (1)	31.75 (1.25)	31.75 (1.25)	44 (1.732)	57.15 (2.25)
Flange Thickness (E) mm (inch)	2.54 (0.1)	3.2 (0.126)	3.8 (0.15)	3.8 (0.15)	3.8 (0.15)	4.76 (0.19)	4.76 (0.19)	5 (0.197)	12.7 (0.5)
Mounting Hole Diameter (F) mm (inch)	3.2 (0.126)	3.2 (0.126)	3.2 (0.126)	3.2 (0.126)	3.2 (0.126)	3.5 (0.14)	3.5 (0.14)	5.4 (0.213)	7 (0.28)
Bolt Circle Diameter (G) mm (inch)	12.7 (0.5)	12.7 (0.5)	19.05 (0.75)	19.05 (0.75)	19.05 (0.75)	22.22 (0.87)	22.22 (0.87)	31 (1.122)	44.45 (1.75)
Maximum Dynamic Load Capacity Kg (lbs)	11 (24)	15 (33)	20 (44)	20 (44)	20 (44)	35 (75)	35 (75)	68 (149)	100 (220)
Maximum Resistance Torque N-m (oz-in)	No torque	No torque	No torque	No torque	No torque	No torque	No torque	No torque	No torque

CTS Circular flange trimming standard nut

Part Number Construction

Example L CTS M1 G R -014AB 0150.00 N -001
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Lead Screw Type
L = Sliding Screw

② Nut Model
S = Without Nut
CS = Circular flange standard nut
CTS = Circular flange trimming standard nut
CTC = Circular flange trimming compression spring anti-backlash nut
CTA = Circular flange trimming torsion spring anti-backlash nut A
TTA = Triangle flange torsion spring anti-backlash nut A
TTB = Triangle flange torsion spring anti-backlash nut B
TC = Triangle flange compression spring anti-backlash nut
NS = Non-standard customization nut

③ Nut Material
M1 = POM
M2 = PBT
M3 = PPS
M4 = Bronze

④ Screw Surface Treatment
G = Standard lubrication grease
T = PTFE coating
S = No oil, No coating
D = Non-standard customization

⑤ Thread Direction
R = Right hand thread
L = Left hand thread
C = Non-standard customization

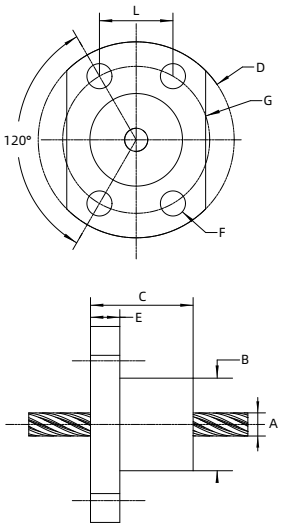
⑥ Lead Screw Specification
014 = Diameter code
AB = Lead code
(Refer to the lead screw dimension table for details)

⑦ Lead Screw Length
Metric (mm) : 0000

⑧ End Type
M = Metric thread
S = Smooth shaft
B = Non-standard customization
N = No machining

⑨ Customization Serial Number

Mechanical Dimension



Material	Operating Temperature
POM	5°C - 80°C (41°F - 176°F)
PBT	-40°C - 120°C (-40°F - 248°F)
PPS	-40°C - 220°C (-40°F - 428°F)

Lead Screw Diameter (A) mm (inch)	6 (0.24)	6.35 (1/4)	8 (0.315)	9.5 (3/8)	10 (0.394)
Nut Diameter (B) mm (inch)	12 (0.47)	12 (0.47)	12 (0.47)	15.8 (0.62)	15.8 (0.62)
Nut Length (C) mm (inch)	13.3 (0.52)	13.3 (0.52)	13.3 (0.52)	25.25 (0.99)	25.25 (0.99)
Flange Diameter (D) mm (inch)	24.4 (0.96)	24.4 (0.96)	24.4 (0.96)	31.8 (1.25)	31.8 (1.25)
Flange Thickness (E) mm (inch)	3.8 (0.15)	3.8 (0.15)	3.8 (0.15)	4.7 (0.185)	4.7 (0.185)
Mounting Hole Diameter (F) mm (inch)	3.25 (0.13)	3.25 (0.13)	3.25 (0.13)	4.2 (0.165)	4.2 (0.165)
Bolt Circle Diameter (G) mm (inch)	19.05 (0.75)	19.05 (0.75)	19.05 (0.75)	22.22 (0.87)	22.22 (0.87)
Mounting Hole Spacing (L) mm (inch)	9.45 (0.37)	9.45 (0.37)	9.45 (0.37)	11.05 (0.435)	11.05 (0.435)
Maximum Dynamic Load Capacity Kg (lbs)	20 (44)	20 (44)	20 (44)	35 (75)	35 (75)
Maximum Resistance Torque N-m (oz-in)	No torque	No torque	No torque	No torque	No torque

CTC Circular flange trimming compression spring anti-backlash nut

Part Number Construction

Example L CTC M1 G R -014AB 0150.00 N -001
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Lead Screw Type
L = Sliding Screw

② Nut Model
S = Without Nut
CS = Circular flange standard nut
CTS = Circular flange trimming standard nut
CTC = Circular flange trimming compression spring anti-backlash nut
CTA = Circular flange trimming torsion spring anti-backlash nut A
TTA = Triangle flange torsion spring anti-backlash nut A
TTB = Triangle flange torsion spring anti-backlash nut B
TC = Triangle flange compression spring anti-backlash nut
NS = Non-standard customization nut

③ Nut Material
M1 = POM
M5 = PA66

④ Screw Surface Treatment
G = Standard lubrication grease
T = PTFE coating
S = No oil, No coating
D = Non-standard customization

⑤ Thread Direction
R = Right hand thread
L = Left hand thread
C = Non-standard customization

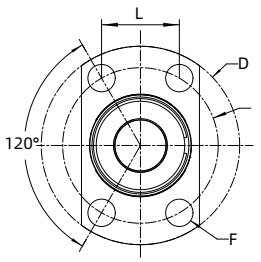
⑥ Lead Screw Specification
014 = Diameter code
AB = Lead code
(Refer to the lead screw dimension table for details)

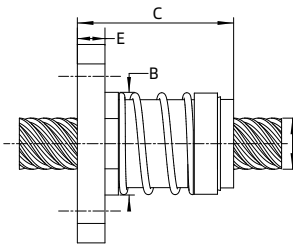
⑦ Lead Screw Length
Metric (mm) : 0000

⑧ End Type
M = Metric thread
S = Smooth shaft
B = Non-standard customization
N = No machining

⑨ Customization Serial Number

Mechanical Dimension





Material	Operating Temperature
POM	5°C - 80°C (41°F - 176°F)
PA66	-5°C - 100°C (-23°F - 212°F)

Lead Screw Diameter (A) mm (inch)	6 (0.24)	6.35 (1/4)	8 (0.315)	9.5 (3/8)	10 (0.394)
Nut Diameter (B) mm (inch)	15.9 (0.625)	15.9 (0.625)	15.9 (0.625)	19.15 (0.75)	19.15 (0.75)
Nut Length (C) mm (inch)	25 (0.98)	25 (0.98)	25 (0.98)	30 (1.18)	30 (1.18)
Flange Diameter (D) mm (inch)	31 (1.22)	31 (1.22)	31 (1.22)	37 (1.46)	37 (1.46)
Flange Thickness (E) mm (inch)	4.1 (0.16)	4.1 (0.16)	4.1 (0.16)	5.15 (0.20)	5.15 (0.20)
Mounting Hole Diameter (F) mm (inch)	3.2 (0.126)	3.2 (0.126)	3.2 (0.126)	5.1 (0.2)	5.1 (0.2)
Bolt Circle Diameter (G) mm (inch)	25 (0.98)	25 (0.98)	25 (0.98)	29 (1.14)	29 (1.14)
Mounting Hole Spacing (L) mm (inch)	12.5 (0.49)	12.5 (0.49)	12.5 (0.49)	14.5 (0.57)	14.5 (0.57)
Maximum Dynamic Load Capacity Kg (lbs)	2.3 (5)	2.3 (5)	3.6 (8)	3.6 (8)	3.6 (8)
Maximum Resistance Torque N-m (oz-in)	0.03 (4)	0.03 (4)	0.04 (5)	0.04 (5)	0.04 (5)

CTA Circular flange cut-edge torsion spring anti-backlash nut A

Part Number Construction

Example L ① | CTA ② | M1 ③ | G ④ | R ⑤ | -014AB ⑥ | 0150.00 ⑦ | N ⑧ | -001 ⑨

① Lead Screw Type
L = Sliding Screw

② Nut Model
S = Without Nut
CS = Circular flange standard nut
CTS = Circular flange trimming standard nut
CTC = Circular flange trimming compression spring anti-backlash nut
CTA = Circular flange trimming torsion spring anti-backlash nut A
TTA = Triangle flange torsion spring anti-backlash nut A
TTB = Triangle flange torsion spring anti-backlash nut B
TC = Triangle flange compression spring anti-backlash nut
NS = Non-standard customization nut

③ Nut Material
M1 = POM
M5 = PA66

④ Screw Surface Treatment
G = Standard lubrication grease
T = PTFE coating
S = No oil, No coating
D = Non-standard customization

⑤ Thread Direction
R = Right hand thread
L = Left hand thread
C = Non-standard customization

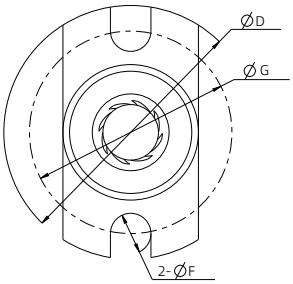
⑥ Lead Screw Specification
014 = Diameter code
AB = Lead code
(Refer to the lead screw dimension table for details)

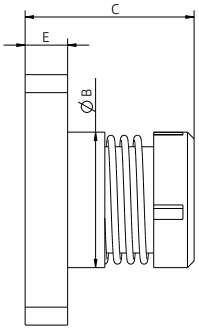
⑦ Lead Screw Length
Metric (mm) : 0000

⑧ End Type
M = Metric thread
S = Smooth shaft
B = Non-standard customization
N = No machining

⑨ Customization Serial Number

Mechanical Dimension





Material	Operating Temperature
POM	5°C - 80°C (41°F - 176°F)
PA66	-5°C - 100°C (-23°F - 212°F)

Lead Screw Diameter (A) mm (inch)	3.5 (9/64)	4.77 (3/16)
Nut Diameter (B) mm (inch)	10.2 (0.4)	10.2 (0.4)
Nut Length (C) mm (inch)	12.72 (0.5)	12.72 (0.5)
Flange Diameter (D) mm (inch)	19.1 (0.75)	19.1 (0.75)
Flange Thickness (E) mm (inch)	3.2 (0.13)	3.2 (0.13)
Mounting Hole Diameter (F) mm (inch)	3.05 (0.12)	3.05 (0.12)
Bolt Circle Diameter (G) mm (inch)	15.24 (0.6)	15.24 (0.6)
Maximum Dynamic Load Capacity Kg (lbs)	2.3 (5)	2.3 (5)
Maximum Resistance Torque N-m (oz-in)	0.004 (0.5)	0.004 (0.5)

TTA Triangular flange torsion spring anti-backlash nut A

Part Number Construction

Example L ① | TTA ② | M1 ③ | G ④ | R ⑤ | -014AB ⑥ | 0150.00 ⑦ | N ⑧ | -001 ⑨

① Lead Screw Type
L = Sliding Screw

② Nut Model
S = Without Nut
CS = Circular flange standard nut
CTS = Circular flange trimming standard nut
CTC = Circular flange trimming compression spring anti-backlash nut
CTA = Circular flange trimming torsion spring anti-backlash nut A
TTA = Triangle flange torsion spring anti-backlash nut A
TTB = Triangle flange torsion spring anti-backlash nut B
TC = Triangle flange compression spring anti-backlash nut
NS = Non-standard customization nut

③ Nut Material
M1 = POM
M5 = PA66

④ Screw Surface Treatment
G = Standard lubrication grease
T = PTFE coating
S = No oil, No coating
D = Non-standard customization

⑤ Thread Direction
R = Right hand thread
L = Left hand thread
C = Non-standard customization

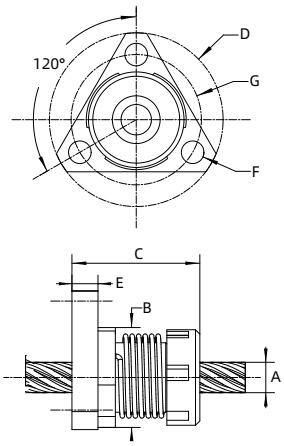
⑥ Lead Screw Specification
014 = Diameter code
AB = Lead code
(Refer to the lead screw dimension table for details)

⑦ Lead Screw Length
Metric (mm) : 0000

⑧ End Type
M = Metric thread
S = Smooth shaft
B = Non-standard customization
N = No machining

⑨ Customization Serial Number

Mechanical Dimension



Material	Operating Temperature
POM	5°C - 80°C (41°F - 176°F)
PA66	-5°C - 100°C (-23°F - 212°F)

Lead Screw Diameter (A) mm (inch)	3.5 (9/64)	4.77 (3/16)
Nut Diameter (B) mm (inch)	11.5 (0.45)	11.5 (0.45)
Nut Length (C) mm (inch)	14.5 (0.57)	14.5 (0.58)
Flange Diameter (D) mm (inch)	20 (0.79)	20 (0.79)
Flange Thickness (E) mm (inch)	3 (0.12)	3 (0.12)
Mounting Hole Diameter (F) mm (inch)	2.6 (0.1)	2.6 (0.1)
Bolt Circle Diameter (G) mm (inch)	15 (0.59)	15 (0.59)
Maximum Dynamic Load Capacity Kg (lbs)	2.3 (5)	2.3 (5)
Maximum Resistance Torque N-m (oz-in)	0.004 (0.5)	0.004 (0.5)

TTB Triangular flange torsion spring anti-backlash nut B

Part Number Construction

Example L TTB M1 G R -014AB 0150.00 N -001
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Lead Screw Type
L = Sliding Screw

② Nut Model
S = Without Nut
CS = Circular flange standard nut
CTS = Circular flange trimming standard nut
CTC = Circular flange trimming compression spring anti-backlash nut
CTA = Circular flange trimming torsion spring anti-backlash nut A
TTA = Triangle flange torsion spring anti-backlash nut A
TTB = Triangle flange torsion spring anti-backlash nut B
TC = Triangle flange compression spring anti-backlash nut
NS = Non-standard customization nut

③ Nut Material
M1 = POM
M2 = PBT
M3 = PPS

④ Screw Surface Treatment
G = Standard lubrication grease
T = PTFE coating
S = No oil, No coating
D = Non-standard customization

⑤ Thread Direction
R = Right hand thread
L = Left hand thread
C = Non-standard customization

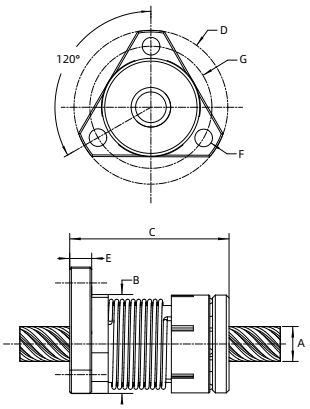
⑥ Lead Screw Specification
014 = Diameter code
AB = Lead code
(Refer to the lead screw dimension table for details)

⑦ Lead Screw Length
Metric (mm) : 0000

⑧ End Type
M = Metric thread
S = Smooth shaft
B = Non-standard customization
N = No machining

⑨ Customization Serial Number

Mechanical Dimension



Material	Operating Temperature
POM	5°C - 80°C (41°F - 176°F)
PBT	-40°C - 120°C (-40°F - 248°F)
PPS	-40°C - 220°C (-40°F - 428°F)

Lead Screw Diameter (A) mm (inch)	6 (0.24)	6.35 (1/4)	8 (0.315)	9.5 (3/8)	10 (0.394)
Nut Diameter (B) mm (inch)	18 (0.7)	18 (0.7)	18 (0.7)	20 (0.79)	20 (0.79)
Nut Length (C) mm (inch)	30 (1.18)	30 (1.18)	30 (1.18)	40 (1.57)	40 (1.57)
Flange Diameter (D) mm (inch)	28 (1.1)	28 (1.1)	28 (1.1)	38.1 (1.5)	38.1 (1.5)
Flange Thickness (E) mm (inch)	4 (0.157)	4 (0.157)	4 (0.157)	7 (0.276)	7 (0.276)
Mounting Hole Diameter (F) mm (inch)	3.2 (0.126)	3.2 (0.126)	3.2 (0.126)	5.1 (0.2)	5.1 (0.2)
Bolt Circle Diameter (G) mm (inch)	22.22 (0.87)	22.22 (0.87)	22.22 (0.87)	28.6 (1.125)	28.6 (1.125)
Maximum Dynamic Load Capacity Kg (lbs)	5 (11)	5 (11)	10 (20)	10 (20)	10 (20)
Maximum Resistance Torque N-m (oz-in)	0.004-0.014 (0.5-2)	0.004-0.014 (0.5-2)	0.007-0.020 (1-3)	0.007-0.020 (1-3)	0.007-0.020 (1-3)

TC Triangular flange compression spring anti-backlash nut

Part Number Construction

Example L ① | TC ② | M1 ③ | G ④ | R ⑤ | -014AB ⑥ | 0150.00 ⑦ | N ⑧ | -001 ⑨

① Lead Screw Type
L = Sliding Screw

② Nut Model
S = Without Nut
CS = Circular flange standard nut
CTS = Circular flange trimming standard nut
CTC = Circular flange trimming compression spring anti-backlash nut
CTA = Circular flange trimming torsion spring anti-backlash nut A
TTA = Triangle flange torsion spring anti-backlash nut A
TTB = Triangle flange torsion spring anti-backlash nut B
TC = Triangle flange compression spring anti-backlash nut
NS = Non-standard customization nut

③ Nut Material
M1 = POM
M5 = PA66

④ Screw Surface Treatment
G = Standard lubrication grease
T = PTFE coating
S = No oil, No coating
D = Non-standard customization

⑤ Thread Direction
R = Right hand thread
L = Left hand thread
C = Non-standard customization

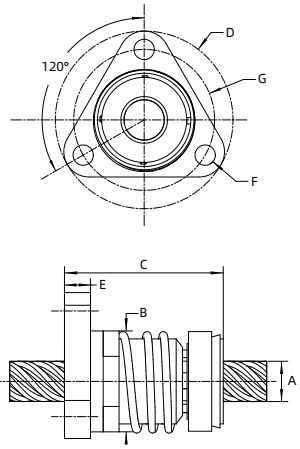
⑥ Lead Screw Specification
014 = Diameter code
AB = Lead code
(Refer to the lead screw dimension table for details)

⑦ Lead Screw Length
Metric (mm) : 0000

⑧ End Type
M = Metric thread
S = Smooth shaft
B = Non-standard customization
N = No machining

⑨ Customization Serial Number

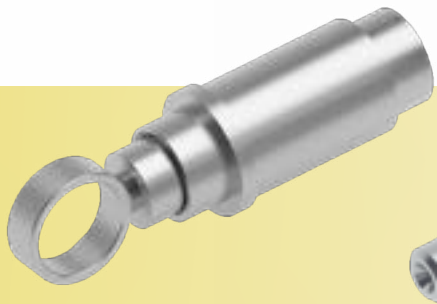
Mechanical Dimension

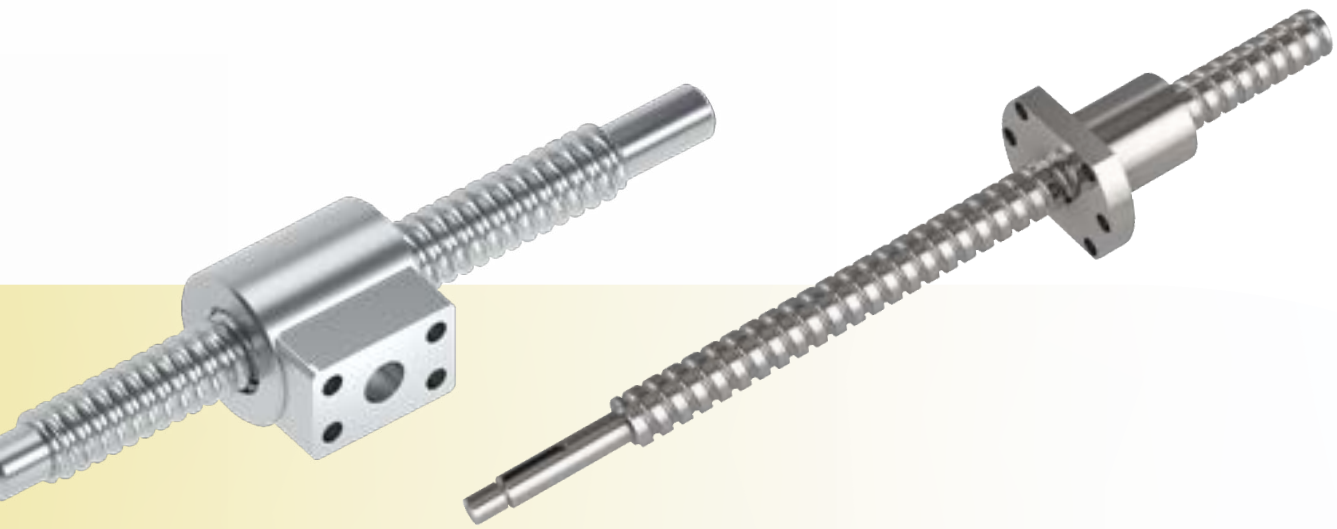


Material	Operating Temperature
POM	5°C - 80°C (41°F - 176°F)
PA66	-5°C - 100°C (-23°F - 212°F)

Lead Screw Diameter (A) mm (inch)	6 (0.24)	6.35 (1/4)	8 (0.315)	9.5 (3/8)	10 (0.394)
Nut Diameter (B) mm (inch)	15.9 (0.625)	15.9 (0.625)	15.9 (0.625)	19.15 (0.75)	19.15 (0.75)
Nut Length (C) mm (inch)	25 (0.98)	25 (0.98)	25 (0.98)	30 (1.18)	30 (1.18)
Flange Diameter (D) mm (inch)	28 (1.1)	28 (1.1)	28 (1.1)	38.3 (1.5)	38.3 (1.5)
Flange Thickness (E) mm (inch)	4.1 (0.16)	4.1 (0.16)	4.1 (0.16)	5.15 (0.2)	5.15 (0.2)
Mounting Hole Diameter (F) mm (inch)	3.2 (0.126)	3.2 (0.126)	3.2 (0.126)	5.1 (0.2)	5.1 (0.2)
Bolt Circle Diameter (G) mm (inch)	22.22 (0.87)	22.22 (0.87)	22.22 (0.87)	28.4 (1.12)	28.4 (1.12)
Maximum Dynamic Load Capacity Kg (lbs)	2.3 (5)	2.3 (5)	3.6 (8)	3.6 (8)	3.6 (8)
Maximum Resistance Torque N-m (oz-in)	0.03 (4)	0.03 (4)	0.04 (5)	0.04 (5)	0.04 (5)

BALL SCREW ASSEMBLY



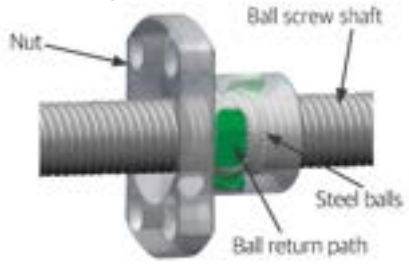


Technical Introduction

Structure of Ball Screws

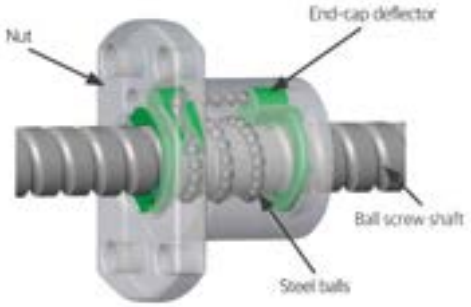
Internal Recirculation Method

The internal recirculation method minimizes the outer diameter and length of the nut, making the micro ball screw structure more compact and lightweight. When the steel balls bear axial load and roll within the grooves of the ball screw shaft and nut, they move along the internal recirculation groove inside the nut into an adjacent rolling groove before returning to the load area for continuous rolling circulation.



Deflector Recirculation Method

The deflector recirculation method refers to a design in which the steel balls circulate within the original rolling groove after passing through a through-hole in the nut via an internal or external end-cap deflector. Compared to the multi-track recirculation method, this design reduces the outer diameter of the nut, making it particularly suitable for medium-lead applications.



Production Range of Ball Screws

Based on the nominal outer diameter of the ball screw shaft, DINGS' ball screws are available in a range from 4mm to 25mm. The table below provides reference values for the maximum production lengths of ball screw shafts in different precision grades. The actual length may vary depending on the shaft end shape, material, and ball screw series. Please consult our sales engineers for specific details.

Maximum Production Length for Precision Ball Screws (Total Length)

Unit : mm

Nominal Ball Screw Diameter \ Precision Grade	C3 (Ground)	C5 (Ground)	C7 (Rolled)	C10 (Rolled)
4	160	170	300	300
5	220	250	600	600
6	240	250	600	600
8	330	400	1200	1200
10	420	450	1200	1200
12	510	550	1200	1200
14	600	700	1200	1200
16	700	800	1200	1200
20	800	1000	1200	1200
25	1000	1250	1200	1200

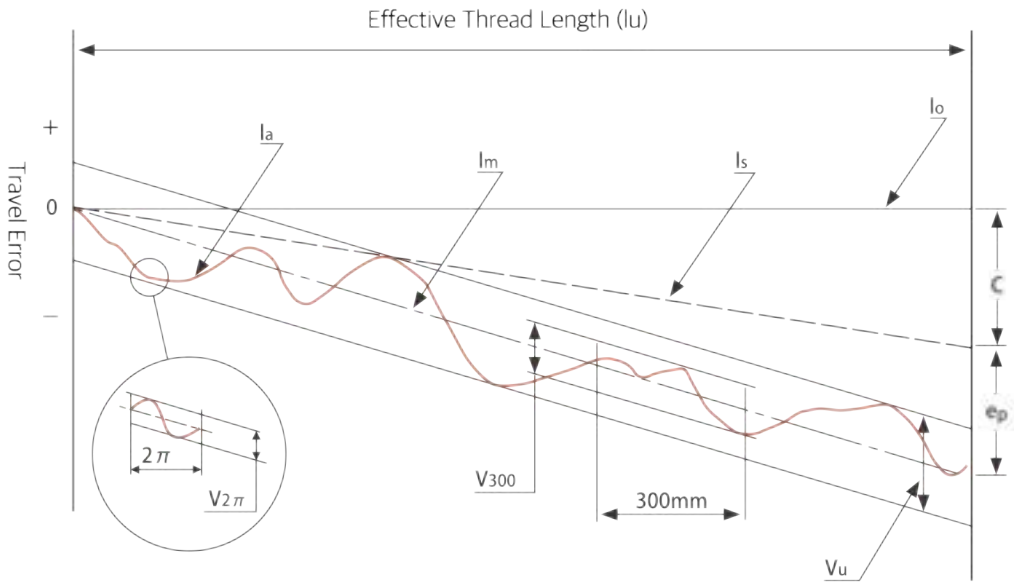
Notes:

1. If the required length exceeds the maximum production length, please contact our sales engineers.
2. The maximum length of cold-rolled ball screws includes 25mm of incomplete threads on both ends.

Lead Accuracy of Ball Screws

The lead accuracy of a ball screw refers to the deviation and fluctuation of the representative travel amount relative to the effective movement of the nut or the effective length of the ball screw shaft's threaded section, as well as the fluctuation over any 300mm section or one full rotation (2π rad) of the effective thread length.

Travel Error Graph



- **Nominal Travel Amount (l_0)** : The axial movement for a given number of revolutions based on the nominal lead
- **Standard Lead (Phs)** : The lead compensated for deformation due to temperature rise and load
- **Target Value for Representative Travel (c)** : The pre-set target value of the standard travel amount, either positive or negative
- **Standard Travel Amount (ls)** : The travel amount when rotated by a certain number of turns according to the standard lead
- **Actual Travel Amount (la)** : The actual axial movement of the nut relative to any rotation angle of the ball screw shaft
- **Representative Travel Amount (lm)** : A straight line representing the tendency of the actual travel amount, calculated using the least-squares method or a similar approximation method
- **Representative Travel Error (e_p)** : The difference between the representative travel amount and the standard travel amount corresponding to the effective movement of the nut or the effective length of the screw thread section
- **Fluctuation (V_u)** : The maximum amplitude between two lines parallel to the representative travel amount
- **Fluctuation (V_{300})** : The maximum fluctuation over any 300mm section of the effective threaded length
- **Fluctuation ($V_{2\pi}$)** : The maximum fluctuation over one full revolution (2π rad) of the effective threaded length

Permissible Representative Travel Error ($\pm e_p$) and Fluctuation (Vu) for Precision Ball Screws

Unit : μm

Precision Grade			C3		C5	
Effective Thread Length (mm)	Exceeding	Below	$\pm e_p$	V_u	$\pm e_p$	V_u
	-	100	8	8	18	18
	100	200	10	8	20	18
	200	315	12	8	23	18
	315	400	13	10	25	20
	400	500	15	10	27	20
	500	630	16	12	30	23
	630	800	18	13	35	25
	800	1000	21	13	40	27

Technical Introduction

Permissible Fluctuation (V_{300}) and ($V_{2\pi}$) per 300mm and 1 Revolution for Precision Ball Screws

Unit : μm

Precision Grade	C3		C5	
Item	V_{300}	$V_{2\pi}$	V_{300}	$V_{2\pi}$
Permissible Value	8	6	18	8

Fluctuation (V_{300}) for C7 and C10 Over 300mm

Unit : μm

Precision Grade	C7	C10
V_{300}	52	210

Representative Travel Error for C7 and C10 is Calculated by the Following Formula

$$e_p = \pm \frac{lu}{300} \times V_{300}$$

lu : Effective Thread Length (mm)

Material, Heat Treatment, and Hardness

The standard materials, heat treatments, and hardness levels of DINGS' ball screws are listed in the table below. These values may vary slightly depending on the series and model. Please refer to our official specification sheets for details.

	Material	Heat Treatment	Surface Hardness of Threaded Section
Ball screw Shaft	SUJ2 (JIS G 4105)	High-Frequency Quenching	HRC 58-62
	S55C (JIS G 4105)	High-Frequency Quenching	HRC 58 above
	SUS440C	Quenching & Tempering	HRC 55 above
Nut	SCM420H (JIS G 4105)	Carburizing and Quenching	HRC 58-62
	SUS440C	Quenching & Tempering	HRC 55 above

Notes: S55C material is used for rolled ball screws, while SUJ2 material is used for ground ball screws.

Axial Clearance and Preload

Axial Clearance

Generally, a small axial clearance exists between the ball screw shaft and the nut in standard single-nut ball screws. When an axial load is applied to a single-nut ball screw, the combination of this clearance and the elastic displacement caused by the axial load results in increased backlash. To eliminate this backlash, the axial clearance of the ball screw should be negative. This is achieved by applying elastic deformation between the ball screw shaft and the nut in advance, a method known as preload.

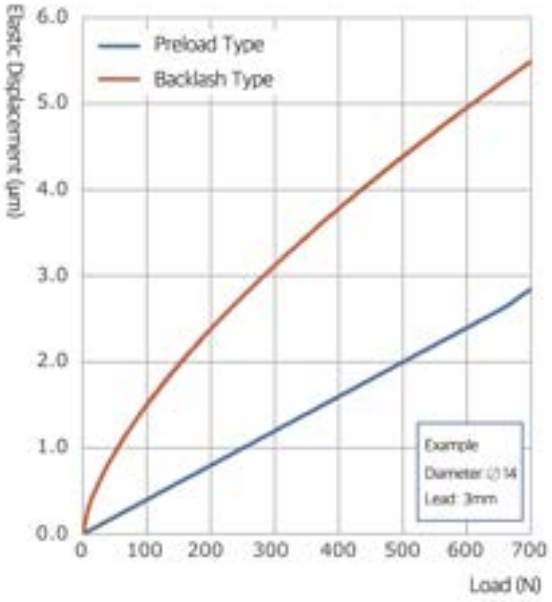
The axial clearance and precision grade combinations for DINGS' ball screws are shown in the table below.

Precision Grade \ Axial Clearance	Z0 (Preload)	T05 (≤0.005mm)	T20 (≤0.02mm)	T50 (≤0.05mm)
4	●	●	●	●
5		●	●	●
6			●	●
8			●	●

Preload Effect

Applying preload not only eliminates axial clearance in ball screws but also reduces axial displacement caused by axial loads, thereby increasing rigidity. The diagram below illustrates the difference in elastic displacement caused by axial load between ball screws with clearance and preloaded (zero-clearance) ball screws (theoretical values). It is evident that preload significantly reduces elastic displacement, thereby enhancing rigidity.

Elastic Displacement Curve for Clearance and Preloaded Specifications



Appropriate Preload Amount

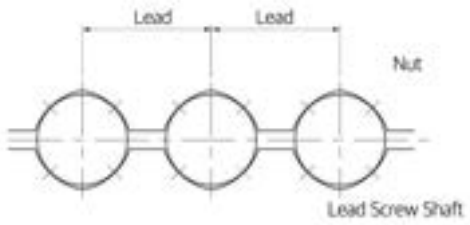
The preload amount should be determined based on the required rigidity or permissible backlash, but applying preload may have the following effects:

1. Increased operating torque
2. Reduced positioning accuracy due to heat generation and temperature rise
3. Shortened service life

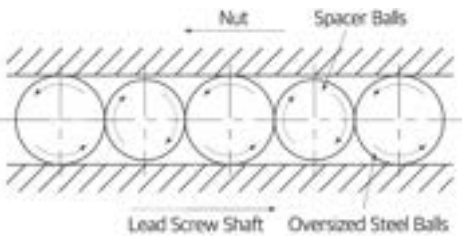
Therefore, the preload amount should be set as low as possible.

Preloading Methods

Ball screws typically use a preload method in which a spacer (shim) is inserted between two nuts, known as the double-nut preload method. DINGS' ball screws fully utilize the characteristics of miniature ball screws by employing the oversize ball preload method, where balls slightly larger than the clearance between the ball screw shaft and the nut are inserted. With this method, only a single nut is required to completely eliminate clearance while maintaining a compact structure. Additionally, by inserting smaller spacer balls between the preloaded larger balls, a decrease in operational performance is avoided.



Preload Condition Using Oversized Steel Balls



Spacer Balls

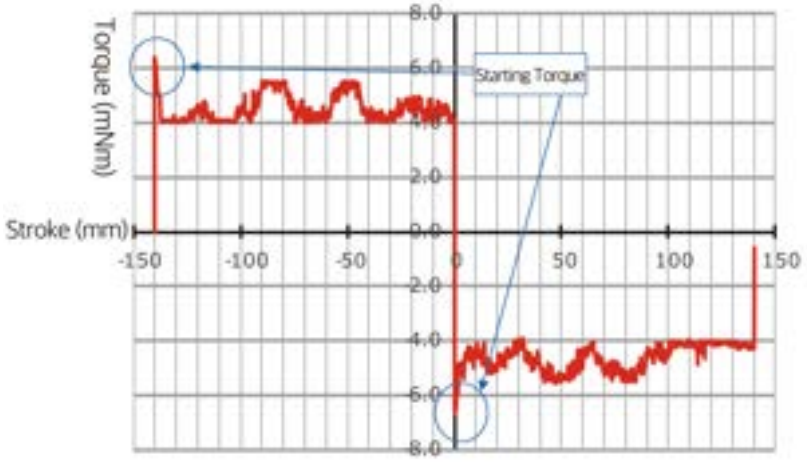
Preload Management Method

Directly measuring and managing the preload amount of a ball screw is quite difficult. Therefore, preload is typically converted into preload operating torque, and the preload is managed by measuring this torque. The preload operating torque values are indicated in the specification sheet. To ensure proper preload management (where axial clearance must be zero), preload torque is always measured under specific conditions. Please note that differences in lubrication and operating conditions may result in variations in operating torque.

Additionally, the starting torque (the torque required to drive the ball screw) will be slightly higher than the operating torque. Please take this into consideration.

Technical Introduction

Torque Measurement Example



Note: For illustration purposes, the torque fluctuations shown in the diagram are exaggerated compared to actual values.

Rust Prevention and Lubrication

Rust Prevention Treatment

DINGS' ball screws are coated with rust prevention oil for long-term storage. Before use, clean the surface with refined kerosene and apply lubricant or grease. Grease application before shipment is available upon customer request. However, long-term storage may still lead to rusting, so please take precautions.

Note: The rust prevention oil applied by DINGS focuses solely on rust protection and does not provide lubrication. Direct use without additional lubrication may reduce ball screw lifespan, increase torque, and cause abnormal heating.

Lubrication

Lubrication is essential for ball screws to prevent increased torque and reduced service life. It helps control heat rising, maintain efficiency, and reduce wear. Ball screws can be lubricated with grease or oil—lithium soap-based grease is recommended for grease lubrication, while ISO VG 32–68 turbine oil is suitable for oil lubrication. Choosing the right lubricant is crucial, especially for miniature ball screws, where grease resistance can increase torque. DINGS' proprietary grease ensures smooth operation and excellent lubrication. We offer MSG No.1 grease for precise low-speed positioning and MSG No.2 grease for high-speed and general-purpose use.

Example of Lubricants for General Operating Conditions

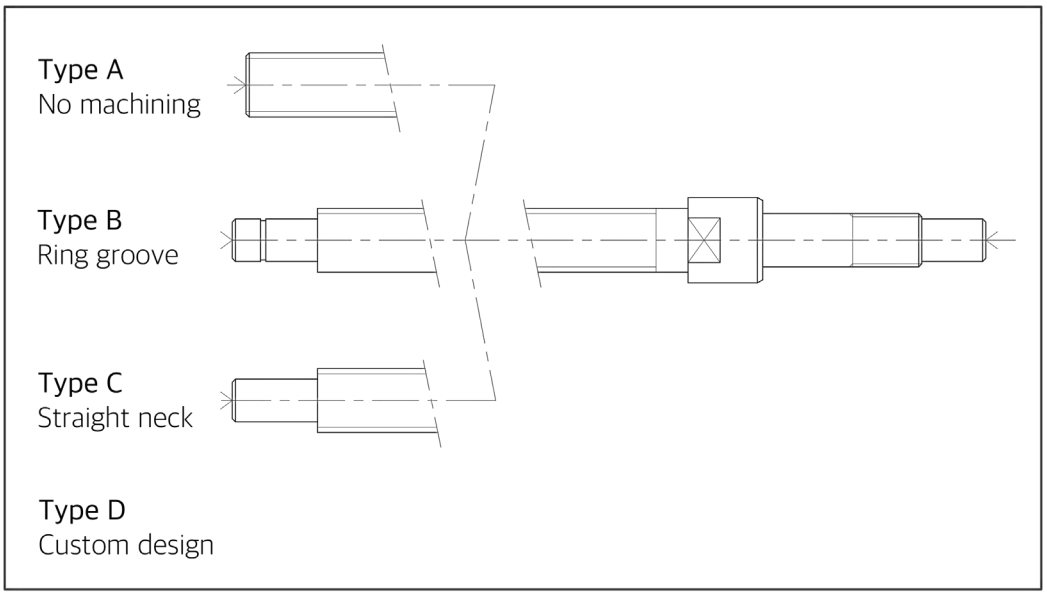
Lubricant	Type	Product Name
Grease	Lithium-based grease	AFG Grease
Lubricating Oil	Slideway oil or turbine oil	Super Multi68

Inspection and Replenishment

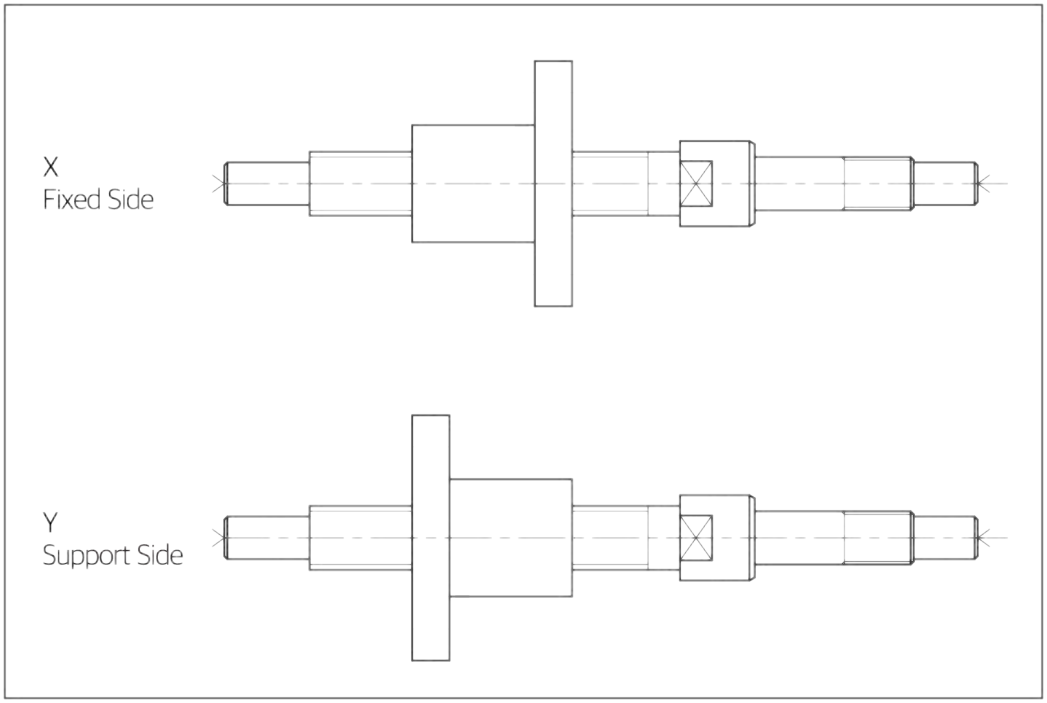
For grease lubrication, inspections should be conducted every 2–3 months, whereas for oil lubrication, inspections should be performed weekly. During inspection, check the oil level and contamination. Replenishment is necessary. When adding new grease, remove as much of the old, discolored grease as possible.

Lubrication Methods	Inspection Interval	Inspection Items	Replenishment or Replacement Interval
Automatic intermittent lubrication	Weekly	Oil level, contamination, etc.	Replenish as needed based on tank capacity during each inspection.
Grease	Every 2–3 months in initial operation	Contaminants, metal chips, etc.	Typically replenished yearly, but adjust as needed. Remove old, discolored grease.
Oil bath	Before daily operation	Oil level management	Replenish based on oil consumption.

Support Side Shaft End Machining Types



Nut Flange Orientation



Instructions and Precautions

Usage Instructions

Keep the original packaging intact during storage. Do not open or damage the internal packaging to prevent contamination or rust, which may degrade product performance.

Operating Instructions

1. Do not disassemble the product, as it may introduce foreign objects, reduce accuracy, or cause accidents.
2. Do not reassemble the ball screw yourself; incorrect assembly may cause damage. Send it to our company for paid repair and reassembly.
3. Prevent accidental nut detachment, which may damage circulation components. Professional inspection and repair are recommended.
4. Dropping the ball screw may cause scratches or damage, leading to poor operation.

Precautions

Dust Prevention

Use in a clean environment with dust protection to prevent debris from entering, which may reduce performance or damage components.

Lubrication

Check lubrication before use to prevent premature failure. Rust prevention oil is not a lubricant; clean it off before applying grease or oil. Regular inspection: Check every 2–3 months for general use and replace dirty grease when necessary.

Permissible Speed and Axial Load

Ball screw performance varies by size, material, and installation. Consult us during the design phase for optimal use conditions.

Overtravel

If the ball screw nut exceeds its travel limit, it may cause ball detachment, damage to circulation components, or indentations on the ball grooves, leading to operational failure. Continued use in this state can result in premature wear or further damage to circulation components. Therefore, overtravel must be avoided.

If overtravel occurs, please contact our company for inspection. We offer a paid inspection service.

Additionally, to prevent the nut from exceeding the thread end or detaching from the threaded section, an O-ring may be installed. Remove the O-ring before use.

Operating Temperature

The maximum recommended operating temperature is typically below 80°C. Exceeding this temperature may result in:

1. Reduced ball circulation efficiency
2. Damage or failure of circulation components
3. Decreased hardness of heat-treated sections

For applications requiring operation above 80°C, please consult our sales engineers.

Off-Center Load

Ball screws are designed for axial thrust and cannot withstand radial or moment loads. Avoid applying radial or moment loads to the nut, as it may cause uneven ball loading and significantly shorten the product's lifespan.

Additionally, during installation, misalignment between the bearing section and the nut bracket can lead to off-center loading, which should be carefully avoided.

Oscillating Motion

When a ball screw undergoes oscillating motion (short stroke + repeated forward and reverse movement), operating torque may gradually increase due to ball compression.

This issue can be mitigated by periodically performing full-stroke movements to release accumulated stress.

Ball Screw Dimension Table

Standard Dia.		Dia. Code	Lead		Lead Code	Outer Dia. (Reference)		Bottom Dia. (Reference)		Corresponding left-hand thread	
Imperial (inch)	Metric (mm)		Imperial (inch)	Metric (mm)		Imperial (inch)	Metric (mm)	Imperial (inch)	Metric (mm)	C5	C7
0.157	4	004	0.039	1	0401	0.157	4	0.13	3.3	YES	-
			0.079	2	0402	0.157	4	0.13	3.3	YES	-
0.236	6	006	0.039	1	0601	0.236	6	0.209	5.3	YES	-
			0.079	2	0602	0.236	6	0.193	4.9	YES	-
			0.236	6	0606	0.236	6	0.197	5	YES	-
0.315	8	008	0.039	1	0801	0.315	8	0.287	7.3	YES	-
			0.079	2	0802	0.315	8	0.28	7.1	YES	-
			0.197	5	0805	0.315	8	0.264	6.7	YES	-
			0.315	8	0808	0.315	8	0.264	6.7	YES	-
			0.394	10	0810	0.315	8	0.264	6.7	YES	-
			0.472	12	0812	0.315	8	0.264	6.7	YES	-
0.394	10	010	0.079	2	1002	0.394	10	0.354	9	YES	-
0.472	12	012	0.079	2	1202	0.472	12	0.437	11.1	YES	-

FBG / FBR Flanged single nut

Part Number Construction

Example FBG 06 01 D X -60 R 90 C3 A 1 X Z0 -001
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

① Series Type
- FBG = Flanged single nut (precision screw)
- FBR = Flanged single nut (rolled screw)
- CBG = Cylindrical single nut (precision screw)
- CBR = Cylindrical single nut (rolled screw)
- MBG = Metric threaded single nut (precision screw)
- MBR = Metric threaded single nut (rolled screw)
- KBG = Square single nut (precision screw)
- KBR = Square single nut (rolled screw)

② Ball Screw Shaft Dia. (mm)
- 06 = 6mm

③ Lead (mm)
- 01 = Standard steel ball lead 1mm
- 01k = Non-standard steel ball lead 1mm

④ Nut Recirculation Method
- D = Internal recirculation method
- S = Deflector recirculation method

⑤ Surface Treatment
- X = With surface treatment

⑥ Threaded Section Length (mm)

⑦ Thread Direction
- R = Right-hand thread
- L = Left-hand thread
- LR = Bi-directional thread

⑧ Total Ball Screw Length (mm)

⑨ Ball Screw Precision Grade
- C3 = JIS Standard C3
- C5 = JIS Standard C5
- C7 = JIS Standard C7
- C10 = JIS Standard C10

⑩ Shaft End Machining
- A = No machining
- B = Ring groove type
- C = Straight neck type
- D = Others

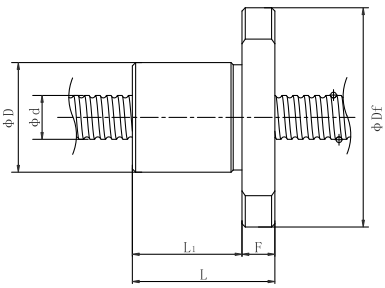
⑪ Grease Type
- 0 = DINGS' recommended lubricant
- 1 = Rust prevention oil
- 2 = Others

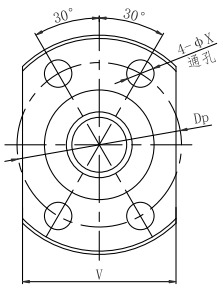
⑫ Nut Orientation
- X = Flange facing the fixed end
- Y = Flange facing the support end
- Z = None

⑬ Axial Clearance
- Z0 = Preload
- T5 = Within 0.005mm
- T20 = Within 0.020mm
- T50 = Within 0.050mm

⑭ Custom Serial Number

Mechanical Dimension





Ball Screw Dia. (d) mm (inch)	4 (0.16)	4 (0.16)	6 (0.24)	6 (0.24)	8 (0.31)	8 (0.31)	8 (0.31)	12 (0.47)
Lead mm (inch)	1 (0.04)	2 (0.08)	1 (0.04)	2 (0.08)	1 (0.04)	2 (0.08)	5 (0.2)	2 (0.08)
Nut Dia. (D) mm (inch)	9 (0.354)	11 (0.433)	12 (0.472)	15 (0.591)	13 (0.511)	14 (0.551)	18 (0.709)	20 (0.787)
Total Nut Length (L) mm (inch)	13 (0.511)	19 (0.748)	15 (0.591)	17 (0.669)	16 (0.63)	16 (0.63)	28 (1.102)	28 (1.102)
Nut Mounting Length (L_1) mm (inch)	10 (0.394)	15 (0.591)	11.5 (0.453)	13 (0.512)	12 (0.472)	12 (0.472)	24 (0.945)	23 (0.906)
Flange Dia. (Df) mm (inch)	19 (0.748)	23 (0.906)	24 (0.945)	29 (1.142)	26 (1.024)	27 (1.063)	31 (1.22)	37 (1.457)
Flange Thickness (F) mm (inch)	3 (0.118)	4 (0.157)	3.5 (0.138)	4 (0.157)	4 (0.157)	4 (0.157)	4 (0.157)	5 (0.197)
Mounting Hole Dia. (X) mm (inch)	2.9 (0.114)	3.4 (0.134)	3.4 (0.134)	3.4 (0.134)	3.4 (0.134)	3.4 (0.134)	3.4 (0.134)	4.5 (0.177)
Bolt Circle Dia. (Dp) mm (inch)	14 (0.551)	17 (0.669)	18 (0.709)	22 (0.866)	20 (0.787)	21 (0.827)	25 (0.984)	29 (1.142)
Nut Flange Width (V) mm (inch)	13 (0.512)	15 (0.591)	16 (0.63)	19 (0.748)	17 (0.669)	18 (0.709)	20 (0.787)	24 (0.945)
Basic Dynamic Load Rating Ca (N)	560	420	680	880	780	1300	1850	1600
Basic Static Load Rating Coa (N)	790	570	1200	1500	1650	2300	3000	3700

CBG / CBR Cylindrical single nut

Part Number Construction

Example CBG 06 01 D X -60 R 90 C3 A 1 X Z0 -001
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

① Series Type
FBG = Flanged single nut (precision screw)
FBR = Flanged single nut (rolled screw)
CBG = Cylindrical single nut (precision screw)
CBR = Cylindrical single nut (rolled screw)
MBG = Metric threaded single nut (precision screw)
MBR = Metric threaded single nut (rolled screw)
KBG = Square single nut (precision screw)
KBR = Square single nut (rolled screw)

② Ball Screw Shaft Dia. (mm)
06 = 6mm

③ Lead (mm)
01 = Standard steel ball lead 1mm
01k = Non-standard steel ball lead 1mm

④ Nut Recirculation Method
D = Internal recirculation method
S = Deflector recirculation method

⑤ Surface Treatment
X = With surface treatment

⑥ Threaded Section Length (mm)

⑦ Thread Direction
R = Right-hand thread
L = Left-hand thread
LR = Bi-directional thread

⑧ Total Ball Screw Length (mm)

⑨ Ball Screw Precision Grade
C3 = JIS Standard C3
C5 = JIS Standard C5
C7 = JIS Standard C7
C10 = JIS Standard C10

⑩ Shaft End Machining
A = No machining
B = Ring groove type
C = Straight neck type
D = Others

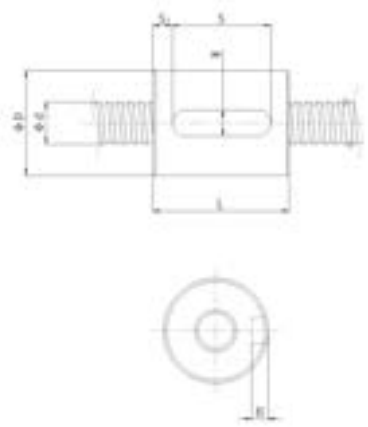
⑪ Grease Type
0 = DINGS' recommended lubricant
1 = Rust prevention oil
2 = Others

⑫ Nut Orientation
X = Flange facing the fixed end
Y = Flange facing the support end
Z = None

⑬ Axial Clearance
Z0 = Preload
T5 = Within 0.005mm
T20 = Within 0.020mm
T50 = Within 0.050mm

⑭ Custom Serial Number

Mechanical Dimension



Ball Screw Dia. (d) mm (inch)	4 (0.157)	6 (0.236)
Lead mm (inch)	1 (0.039)	6 (0.236)
Nut Dia. (D) mm (inch)	9 (0.354)	14 (0.551)
Total Nut Length (L) mm (inch)	10 (0.394)	17.2 (0.677)
Keyway position dimension (S_1) mm (inch)	*	5 (0.197)
Keyway length (S) mm (inch)	*	6 (0.236)
Keyway width (W) mm (inch)	*	3 (0.118)
Keyway depth (H) mm (inch)	*	1.2 (0.047)
Basic Dynamic Load Rating Ca (N)	560	870
Basic Static Load Rating Coa (N)	790	1450

MBG / MBR Metric threaded single nut

Part Number Construction

Example MBG 06 01 D X -60 R 90 C3 A 1 X Z0 -001
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

① Series Type
FBG = Flanged single nut (precision screw)
FBR = Flanged single nut (rolled screw)
CBG = Cylindrical single nut (precision screw)
CBR = Cylindrical single nut (rolled screw)
MBG = Metric threaded single nut (precision screw)
MBR = Metric threaded single nut (rolled screw)
KBG = Square single nut (precision screw)
KBR = Square single nut (rolled screw)

② Ball Screw Shaft Dia. (mm)
06 = 6mm

③ Lead (mm)
01 = Standard steel ball lead 1mm
01k = Non-standard steel ball lead 1mm

④ Nut Recirculation Method
D = Internal recirculation method
S = Deflector recirculation method

⑤ Surface Treatment
X = With surface treatment

⑥ Threaded Section Length (mm)

⑦ Thread Direction
R = Right-hand thread
L = Left-hand thread
LR = Bi-directional thread

⑧ Total Ball Screw Length (mm)

⑨ Ball Screw Precision Grade
C3 = JIS Standard C3
C5 = JIS Standard C5
C7 = JIS Standard C7
C10 = JIS Standard C10

⑩ Shaft End Machining
A = No machining
B = Ring groove type
C = Straight neck type
D = Others

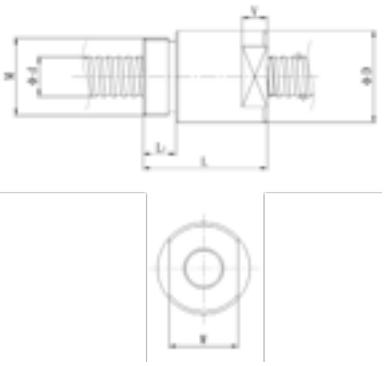
⑪ Grease Type
0 = DINGS' recommended lubricant
1 = Rust prevention oil
2 = Others

⑫ Nut Orientation
X = Flange facing the fixed end
Y = Flange facing the support end
Z = None

⑬ Axial Clearance
Z0 = Preload
T5 = Within 0.005mm
T20 = Within 0.020mm
T50 = Within 0.050mm

⑭ Custom Serial Number

Mechanical Dimension



Ball Screw Dia. (d) mm (inch)	4 (0.157)	6 (0.236)	8 (0.315)	10 (0.394)
Lead mm (inch)	1 (0.039)	2 (0.079)	2 (0.079)	2 (0.079)
Nut Dia. (D) mm (inch)	10 (0.394)	12 (0.472)	16 (0.63)	19.5 (0.768)
Total Nut Length (L) mm (inch)	16.5 (0.65)	16 (0.63)	27 (1.063)	22 (0.866)
Thread Size (M) mm (inch)	M8X0.75	M10X1	M14X0.75	M17X1
Thread Length (L_1) mm (inch)	5 (0.197)	5 (0.197)	5 (0.197)	8.2 (0.323)
Flat Width(W) mm (inch)	9 (0.354)	10 (0.394)	14 (0.551)	*
Flat Depth (V) mm (inch)	1.5 (0.059)	2 (0.079)	4 (0.157)	*
Basic Dynamic Load Rating Ca (N)	560	880	1300	1500
Basic Static Load Rating Coa (N)	790	1500	2300	2900

KBG / KBR Square single nut

Part Number Construction

Example KBG 06 01 D X -60 R 90 C3 A 1 X Z0 -001
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

① Series Type
- FBG = Flanged single nut (precision screw)
- FBR = Flanged single nut (rolled screw)
- CBG = Cylindrical single nut (precision screw)
- CBR = Cylindrical single nut (rolled screw)
- MBG = Metric threaded single nut (precision screw)
- MBR = Metric threaded single nut (rolled screw)
- KBG = Square single nut (precision screw)
- KBR = Square single nut (rolled screw)

② Lead Screw Shaft Dia. (mm)
- 06 = 6mm

③ Lead (mm)
- 01 = Standard steel ball lead 1mm
- 01k = Non-standard steel ball lead 1mm

④ Nut Recirculation Method
- D = Internal recirculation method
- S = Deflector recirculation method

⑤ Surface Treatment
- X = With surface treatment

⑥ Threaded Section Length (mm)

⑦ Thread Direction
- R = Right-hand thread
- L = Left-hand thread
- LR = Bi-directional thread

⑧ Total Lead Screw Length (mm)

⑨ Lead Screw Precision Grade
- C3 = JIS Standard C3
- C5 = JIS Standard C5
- C7 = JIS Standard C7
- C10 = JIS Standard C10

⑩ Shaft End Machining
- A = No machining
- B = Ring groove type
- C = Straight neck type
- D = Others

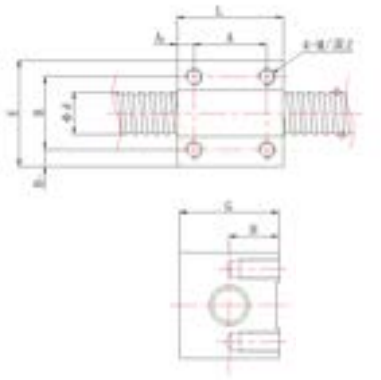
⑪ Grease Type
- 0 = DINGS' recommended lubricant
- 1 = Rust prevention oil
- 2 = Others

⑫ Nut Orientation
- X = Flange facing the fixed end
- Y = Flange facing the support end
- Z = None

⑬ Axial Clearance
- Z0 = Preload
- T5 = Within 0.005mm
- T20 = Within 0.020mm
- T50 = Within 0.050mm

⑭ Custom Serial Number

Mechanical Dimension



Lead Screw Dia. (d) mm (inch)	6 (0.236)	8 (0.315)
Lead mm (inch)	1 (0.039)	1 (0.039)
Total Nut Length (L) mm (inch)	20 (0.787)	20 (0.787)
Nut Width (E) mm (inch)	13 (0.512)	14 (0.551)
Nut Height (G) mm (inch)	11 (0.433)	13 (0.512)
Mounting hole size (B1) mm (inch)	2.5 (0.098)	3 (0.118)
Mounting hole size (B) mm (inch)	8 (0.315)	8 (0.315)
Mounting hole size (A1) mm (inch)	2.5 (0.098)	2.5 (0.098)
Mounting hole size (A) mm (inch)	15 (0.591)	15 (0.591)
Threaded hole (M) / Depth (Z) mm	M3/ Depth 3.5	M2.5x0.45/Depth 3
Basic Dynamic Load Rating Ca (N)	680	780
Basic Static Load Rating Coa (N)	1200	1650

PLANETARY ROLLER SCREW ASSEMBLY

Technical Introduction

Introduction to Planetary Roller Screws

Planetary roller screws convert rotary motion into linear motion, combining thread transmission and rolling screw characteristics. The load transfers from the screw shaft to the nut via multiple threaded rollers in planetary motion. Their unique design prevents relative axial displacement, enabling continuous rolling within a closed system using rolling/sliding friction for power transmission.

Built with bearing technology, they use high-strength bearing steel for durability and fatigue resistance, ensuring longevity in heavy-load applications.

Standard Planetary Roller Screws

1. Ground roller screws conforming to ISO 3408-3 precision grades 3, 5, and 7
2. Suitable for high-speed and long-stroke linear motion applications
3. Extremely quiet operation, ideal for low-interference and low-noise applications
4. Robust design, suited for heavy loads, vibrations, and harsh environments

Inverted Planetary Roller Screws

1. Ground roller screws conforming to ISO 3408-3 precision grades 3, 5, and 7
2. Same high-speed capability as standard planetary roller screws but optimized for short linear strokes
3. Robust design, suitable for medium loads and demanding environments
4. Highly customized shaft and nut design
5. Direct load application on the push tube
6. Integrated motorized design: The nut functions as the motor rotor, enabling a compact, lightweight, and easily mountable electromechanical actuator system

Assembly Recommendations

Handling

Planetary roller screw assemblies are precision components that require careful handling to avoid impact, contamination, or corrosion. After cleaning, do not touch the screw with bare hands, as uncoated bearing steel is highly sensitive to corrosion.

Storage

1. Store planetary roller screws away from contaminants, vibrations, impacts, humidity, and other harmful conditions.
2. Vacuum packaging or storage in a clean oil bath is recommended to prevent contamination.
3. Avoid placing planetary roller screws on workbenches or racks without proper support. Unsupported long-term storage can cause bending and loss of precision.
4. Standard rust inhibitors provide protection for 12–18 months. The recommended storage temperature is -10°C to +50°C. For long-term storage, special packaging such as PVC sleeves can be used.

Nut Removal

If the nut must be removed from the shaft (e.g., for end machining), check the nut's orientation before removal.

To maintain the correct axial clearance and starting torque, the nut and shaft are precision-matched. During removal, mark the positions of the nut, shaft, and mounting direction to ensure proper reassembly. Keep all components free from contamination during removal and reinstallation.

Caution: Planetary roller screws are precision components—handle with extra care during disassembly and reassembly.

Lubrication Recommendations

Main Purposes of Lubrication

1. Prevent metal-to-metal contact between rolling surfaces and minimize metal fatigue
2. Prevent corrosion
3. Reduce wear
4. Extend the service life of the roller screw
5. Ensure performance under specific operating conditions (temperature, humidity, vacuum, corrosive environments, etc.)

Planetary roller screws have similar friction conditions to ball screws, so lubricants recommended for gears and ball screws are also suitable.

By default, they are pre-lubricated at the factory. If customers request no lubrication, a rust inhibitor is added before shipping. Before applying grease, remove the rust inhibitor to prevent compatibility issues.

Lubrication Recommendations

1. Lubrication Process

   Add grease in multiple stages. Between applications, rotate the screw shaft or nut several times to ensure full coverage within the operating length.

2. Pre-Use Inspection

   Before initial operation, verify that the components are properly lubricated.

3. First Lubrication Interval

   Reapply grease after 100,000 rotations to remove aged or contaminated grease, extending service life.

After initial and first re-lubrication, follow a lubrication maintenance plan to optimize performance and longevity. This applies to industrial environments with no external contaminants and temperatures below 40°C. For applications where standard grease is insufficient, shorten re-lubrication intervals. Always use the same grease type to avoid compatibility issues. If switching, check miscibility and thoroughly clean the nut and screw shaft. For lubrication plans based on speed, load, and temperature conditions, consult our sales engineers.

Initial Operation of the Screw

After cleaning, installation, and lubrication, run the nut at low speed (<50 r/min) and light load (<5% of dynamic load capacity) for several full strokes to check the position of limit switches and reversing mechanisms. After verification, normal load and speed can be applied.

During the first few hours of operation, the roller screw will undergo a break-in process. Once the break-in period is complete, inject half the standard grease volume to replace any grease contaminated by wear particles.

At the end of the screw's lifespan, the following signs may appear:

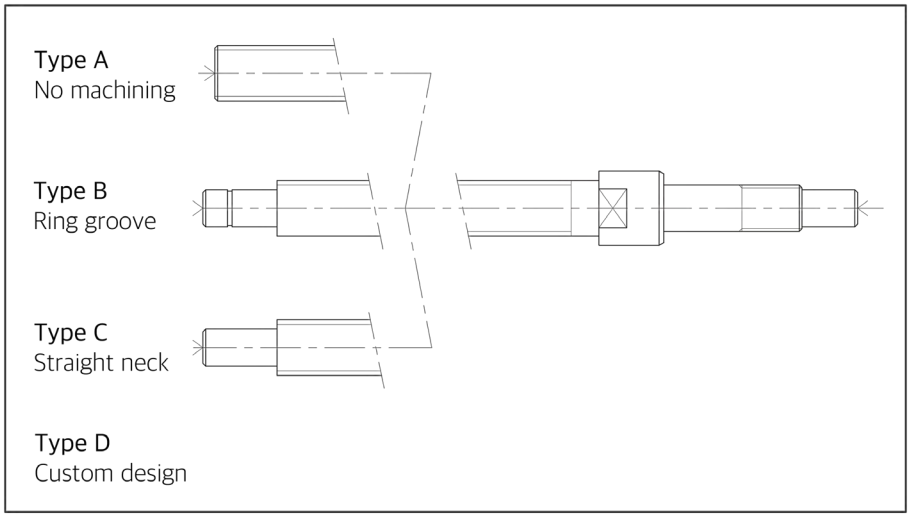
1. Fatigue flaking
2. Increased axial clearance
3. Deteriorated performance, higher driving torque, and elevated operating temperature

These signs are key indicators for monitoring the operational condition of the roller screw. Additionally, visibly contaminated grease suggests that the screw has reached the end of its lifespan. Immediate replacement is recommended to prevent equipment damage.

Important Notes:

Poor grease quality, insufficient lubrication, excessive stress, misalignment, tilting, or exceeding operational limits can increase the roller screw's working temperature. Monitoring temperature changes helps detect potential issues early.

Shaft End Types



Part Number Construction

PS	1	FC	09	0	-	105	02	4	R	C7	110	A	-	8	T50	0	N	-001
①	②	③	④	⑤		⑥	⑦	⑧	⑨	⑩	⑪	⑫		⑬	⑭	⑮	⑯	⑰

① Series Type
- PS = Precision standard planetary roller screw
- PI = Precision inverted planetary roller screw

② Nut Type
- 1 = Single nut

③ Nut Configuration
- C = Cylindrical nut
- SFF = Single-flange nut (fixed end)
- SFS = Single-flange nut (support end)
- SCFF = Cut-edge flange nut (fixed end)
- SCFS = Cut-edge flange nut (support end)
- MF = Center flange nut
- NS = Non-standard nut
- FC = Custom nut

④ Nut Length
- 09 = 90mm
- 13 = 124mm

⑤ Sealing
- 0 = No seal
- 1 = With seal

⑥ Central Screw Diameter (mm)

⑦ Lead (mm)

⑧ Number of Thread Starts

⑨ Central Screw Thread Direction
- R = Right-hand thread
- L = Left-hand thread

⑩ Screw/Nut Precision Grade
- C3 = JIS Standard C3
- C5 = JIS Standard C5
- C7 = JIS Standard C7

⑪ Total Screw Length
- 09 = 90mm
- 13 = 124mm

⑫ Shaft End Type
- A = No machining
- B = Ring groove
- C = Straight neck
- D = Others

⑬ Number of Circumferential Rollers

⑭ Axial Clearance
- T50 = ≤ 0.05mm

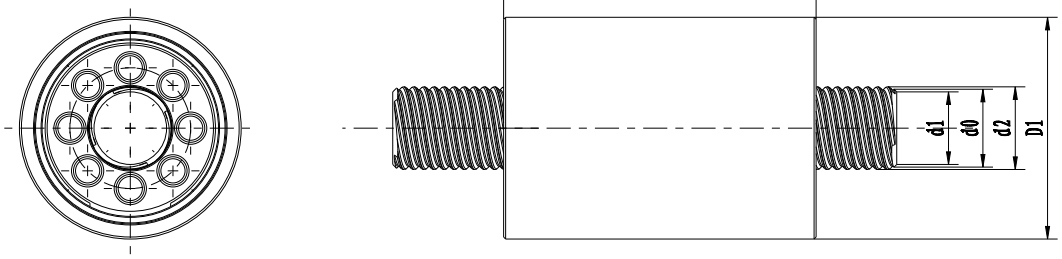
⑮ Grease Type
- 0 = Lubricating grease
- 1 = Rust prevention oil
- 2 = Others

⑯ Surface Treatment
- N = None

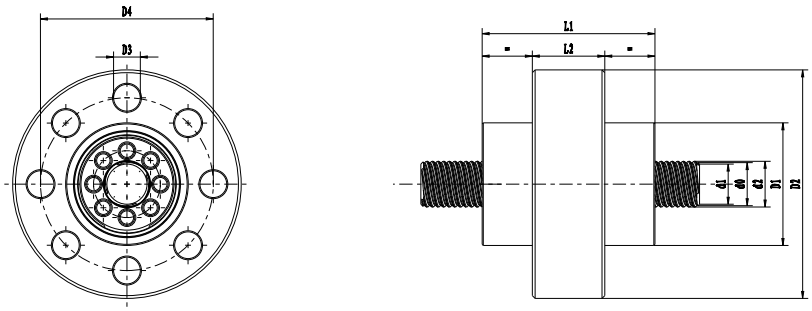
⑰ Custom Serial Number

Standard Planetary Roller Screw Nut

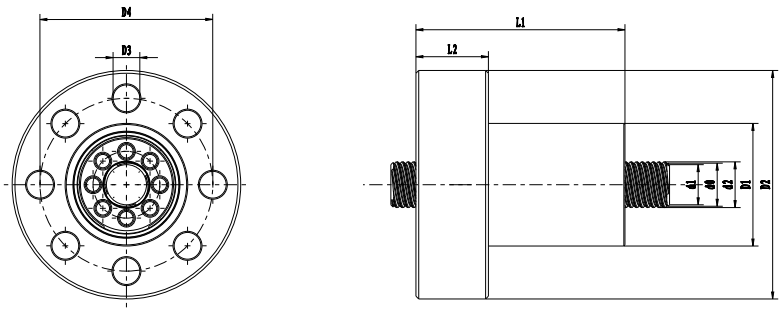
C = Cylindrical nut



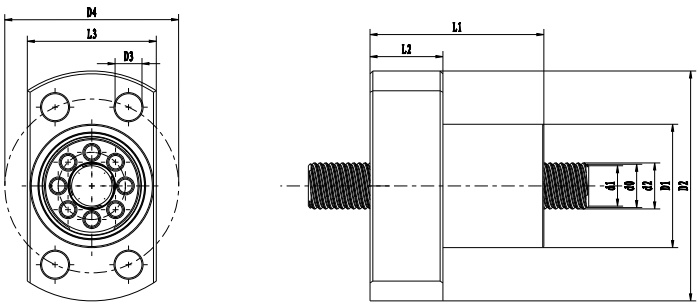
MF = Center flange nut



SFF/SFS = Single-flange nut



SCFF/SCFS = Cut-edge single-flange nut



Standard Planetary Roller Screw nut specification table

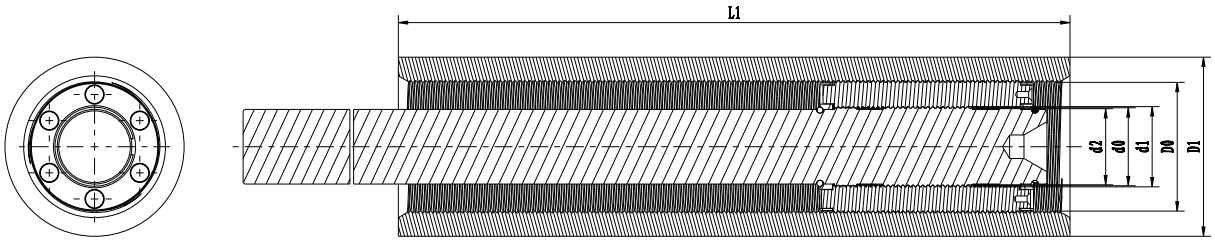
Central screw dia. (mm)		8	8	9	10	10	12	12	15
Lead (mm)		3	4	4.5	3	4	3	4	3
Number of thread starts		4	4	4	5	5	5	5	5
Screw (mm)	Helix angle	6.81	9.04	9.04	5.2	6.91	4.55	6.06	3.64
	d1	8.28	8.38	9.3	10.73	10.8	12.23	12.3	15.23
	d0	8	8	9	10.5	10.5	12	12	15
	d2	7.74	7.65	8.54	10.29	10.22	11.79	11.72	14.79
Nut (mm)	D1	21	21	23	24	24	26	26	34
	D2	41	41	44	46	46	46	46	56
	D3	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5.3
		M5	M5	M5	M5	M5	M5	M5	M6
	D4	31	31	36	36	36	36	36	45
	L1	31	31	37	31	31	31	31	40
	L2	13	13	13	13	13	13	13	18
	L3	23	23	23	26	26	28	28	36
Dynamic load Ca	KN	7.92	8.56	9.41	11.44	12.48	12.56	13.76	20.4
Static load C0a	KN	14	14.4	15.44	19.28	20.08	20.88	21.76	40.4
Stiffness coefficient Fk	$N^{2/3}/\mu m$	21.36	18.72	18.1	29.52	26.08	30.32	26.64	40.72
Axial clearance	mm	0.04	0.05	0.05	0.03	0.04	0.02	0.03	0.02
Forward efficiency	%	85	84	82	85	85	84	85	83
Reverse efficiency	%	84	83	80	83	84	83	84	81

Standard Planetary Roller Screw nut specification table

15	18	18	20	20	21	21	23	23	25	25	25
4	3	4	3	4	3	4	3	4	3	4	5
5	5	5	5	5	5	5	5	5	6	5	5
4.85	3.04	4.05	2.8	3.74	2.6	3.47	2.43	3.24	2.28	3.04	3.79
15.3	18.23	18.3	19.73	19.8	21.23	21.3	22.73	22.8	24.19	24.3	24.38
15	18	18	19.5	19.5	21	21	22.5	22.5	24	24	24
14.72	17.79	17.72	19.29	19.22	20.79	20.72	22.29	22.22	23.82	23.72	23.65
34	40	40	42	42	45	45	45	45	48	53	53
56	62	62	64	64	67	67	68	68	71	84	84
5.3	5.3	5.3	5.3	5.3	5.3	5.3	6.3	6.3	6.3	6.3	6.3
M6	M6	M6	M6	M6	M6	M6	M7	M7	M7	M7	M7
45	51	51	53	53	56	56	56	56	59	70	70
40	48	48	55	55	55	55	55	55	48	64	64
18	18	18	20	20	18	18	20	20	20	20	20
36	42	42	44	44	47	47	47	47	50	55	55
21.44	28	30	34.16	36.56	42.32	45.36	44.4	47.6	35.52	61.6	65.04
39.6	60.88	61.04	80.48	80.64	84.24	84.4	87.76	87.92	71.92	66.48	129.2
34.64	49.44	42.56	56.08	48.32	56.72	49.04	57.44	49.68	60.8	59.28	52.8
0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03
84	82	84	81	83	80	83	80	82	79	82	83
83	79	82	78	81	77	81	76	80	75	79	81

Inverted Planetary Roller Screw Nut Specification Table

Inverted planetary roller screw nut



Central screw dia. (mm)		10.5	10.5	10.5	12	12
Lead (mm)		2	3	3.5	2	3
Number of thread starts		3	3	3	3	3
Screw (mm)	Helix angle	3.47	5.2	6.06	3.04	4.55
	d1	10.75	10.875	10.75	12.25	12.38
	d0	10.5	10.5	10.5	12	12
	d2	10.26	10.15	10.1	11.765	11.65
Nut (mm)	D1 min	24	24	24	26	26
	L1 max	140	140	140	160	160
Dynamic load Ca	KN	10.72	11.44	12.11	13.2	14.16
Static load C0a	KN	16.64	12.8	10.02	21.68	18.79
Stiffness coefficient Fk	$N^{2/3}/\mu m$	26.08	18	11.53	29.2	20.78
Axial clearance	mm	0.03	0.04	0.04	0.03	0.04
Forward efficiency	%	83	85	87	82	84
Reverse efficiency	%	81	83	84	79	81

Inverted Planetary Roller Screw Nut Specification Table

13.5	15	18	18	21	21	24	24
2	2	2	3	2	3	2	3
3	3	3	3	3	3	3	3
2.7	2.43	2.03	3.04	1.74	2.6	1.52	2.28
13.75	15.25	18.25	18.375	21.25	21.375	24.25	24.375
13.5	15	18	18	21	21	24	24
13.264	14.764	17.764	17.646	20.764	20.646	23.764	23.646
30	32	38	38	45	45	50	50
180	200	240	240	280	280	280	280
14.32	22.16	28.96	31.28	43.6	47.68	59.04	65.12
23.12	44.16	61.76	59.92	84.8	83.84	128.8	129.2
29.76	40.8	47.2	37.52	54	43.36	64.96	52.8
0.03	0.03	0.03	0.04	0.03	0.04	0.03	0.04
81	80	78	82	76	80	74	79
78	76	73	79	71	77	67	75

DINGS'

Precision Motion Specialist

Headquarter , CHINA

Jiangsu DINGS' Intelligent Control Technology Co., LTD

No. 2850 Luheng Road, Changzhou Economic Development Zone, Jiangsu Province, China

Phone : +86-519-85177826
Fax : +86-519-85177807
E-mail : info@dingsmotion.com
www.dingsmotion.com

Shenzhen Office

Room 1105, Block C, CIMC industry demonstation park, Qiaoming Road, Guangming district, Shenzhen City

E-mail : info@dingsmotion.com

International Office

DINGS' Motion USA

355 Cochrane Circle Morgan Hill, CA 95037

Phone : +1-408-612-4970
E-mail : sales@dingsmotionusa.com
www.dingsmotionusa.com

DINGS' Motion Europe

4 Avenue du Grand Trémoutier 44120 - Vertou - France

Phone : +33-(0)6-41-37-80-07
E-mail : sebastien@dingsmotion.com
http://fr.dingsmotion.com

DINGS' KOREA Co., Ltd

C-702, 158, Haneulmaeul-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, Republic of Korea

Phone : +82-31-994-0755
Fax : +82-70-4325-0755
E-mail : daniel@dingsmotion.com
www.dingsmotion.kr

DINGS' JAPAN

101, 2-27-18, Nishi-kojiya, Ota-ku, Tokyo 144-0034 JAPAN

Phone : +81-3-6811-1335
E-mail : tsukahara@dingsmotion.com

www.dingsmotion.com