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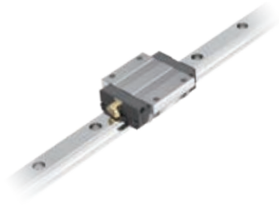
CHINA ROLLING

NANJING TECHNICAL EQUIPMENT MANUFACTURE CO., LTD.

Contents



Precision ball screw — 84 - 175

Brave to open up, good at innovation, good at details, successful by hard work

Nanjing Technical Equipment Manufacture Co., Ltd. has accumulated 70 years of rich experience in the field of rolling functional parts with dedicated research and professional manufacturing and with technology, equipment, scale, brand, culture and many other advantages, in the "large, high speed, high precision, alternative imports" unique characteristics. The company is now a high-tech enterprise, a single champion demonstration enterprise of the manufacturing industry of the Ministry of Industry and Information Technology, and was selected into the list of "Science reform demonstration enterprises" published by the Office of the Leading Group of State-owned Enterprise Reform of The State Council.

The company vigorously promotes the core values of "integrity, dedication, cooperation and innovation", and takes GB/T19580 "Performance Excellence" as the management standard.It has passed the certification of IS09001 quality management system, IS014001 environmental management system, 0HSAS18001 Occupational Health and safety Management System and IS010012 Measurement Management System AAA, which promotes the basic management of enterprises to be more scientific and standardized.The company adheres to the core of "behind the brand is quality, behind the quality is management, behind the management is culture, behind the culture is virtue", and creates an excellent modern enterprise, which is recognized by users and society.

The company was awarded the title of "National Quality Benchmark in 2021" by the China Quality Association, and successively won the honors of "National Customer Satisfaction Enterprise", "National Customer Satisfaction Product", and "Top Ten Enterprises for Careful brand Creation Activities". The company was awarded the title of "China Machinery Industry Quality Integrity Enterprise" and "China Machinery Industry Famous Brand Product" by China Machinery Industry Federation, and the management results "Experience in implementing excellent performance management mode" were awarded the title of "China Machinery Industry Quality Brand Benchmark".

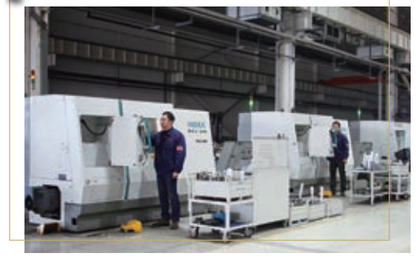
The company has built a full-performance test room of rolling functional parts, high-speed ball screw pair 60m/min running noise 70dB, high-speed linear guide rail pair 60m/min running noise 68dB, for precision horizontal machining center batch matching ball screw , rolling liner guide. To achieve the fast speed of each axis 48m/min, positioning accuracy 0.002mm, repeated positioning accuracy 0.001mm, the company has built a complete equipment support system, built a high-precision ball screw, large ball screw, rolling liner guide rail production line. The company's products are high-speed, high-precision and high-grade CNC machine tools, which promote the upgrading of domestic rolling function parts and replace imports. Many of the company's products have won national patents, China Machinery Industry Science and Technology Awards, national key new product certificates, etc.

The company focuses on the needs of users, provides professional services, and takes the in-depth adaptation to the market and better meet the users as an important criterion for testing the development of enterprises; With the continuous improvement of product quality, considerate and thoughtful pre-sale, sale and after-sales service, the business integrity and social responsibility of the enterprise are fully demonstrated.

The company takes the revitalization of national industry as its responsibility, takes "brand is gold, service is the heart" as its business philosophy, takes "high quality, high precision, high reliability" as its brand strategy, takes "creating a national brand of rolling functional parts" as its brand goal, and uses high-quality products and innovative services to enhance the company's brand value and create a national brand of rolling functional parts.

Excellent Equipment
Quality guarantee

German CNC 10 meters high speed&hard thread milling machine



INDEX Turning&milling CNC center

10 meters outer circle grinding machines

Japanese Mitsui 2 meters high accuracy thread grinding machine

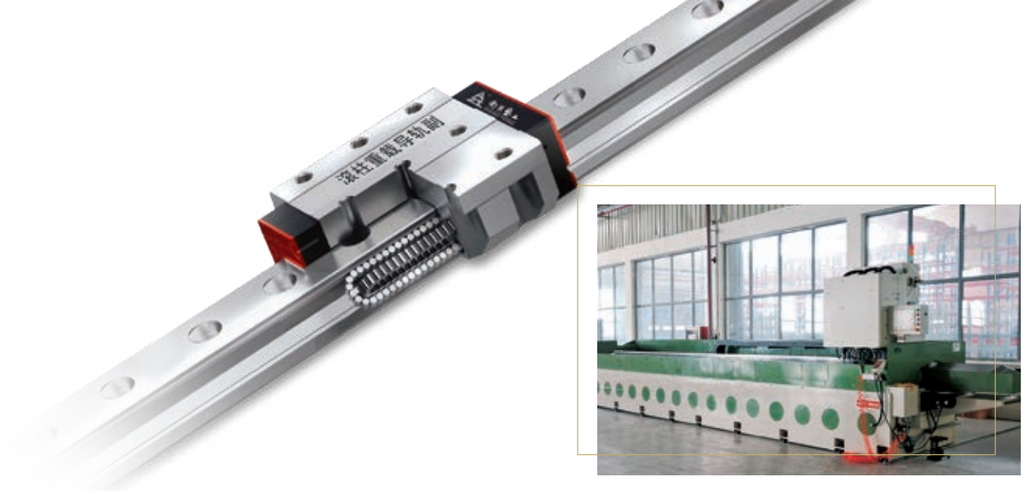
5 meters CNC thread grinding machine

10 meters Laser measuring instrument for ball screw

European high accuracy CNC hard turning machine for nut thread

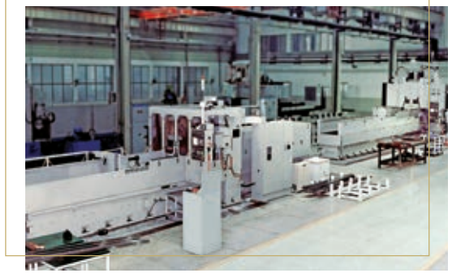
10 meter CNC middle frequency quenching machine

German MAE high performance on-line detection of automatic straightening machine



6 meters high accuracy hole-punching machine

German EFD CNC linear guide small deformation straightening&quenching machine



Japanese Okamoto 4 meters CNC linear guide grinding machine

6 meters CNC precision surface grinding machine

German BLOHM block grinding machine

Japanese Okamoto 6 meter CNC linear guide grinding machine

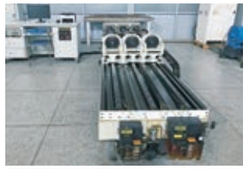
Integrated measuring instrument of linear guide

Full performance lab

Comprehensively improve product perfoemance

Static stiffness test for ball screw and linear guide

High speed performance test



Reliability test

Accuracy retention test for ball screw and linear guide

Fatigue life test for ball screw and linear guide

German BLOHM block grinding machine

Japanese Okamoto 6 meter CNC linear guide grinding machine

Interchangeable linear guide

- Ball type GGB16-GGB85、Roller type GZB25-GZB125 full
- Range coverage Max. Single length 6m
- Arbitrary rails and blocks can be interchangeable.

DKFZ、DKFZD High speed &precision ball screw

GZB precision heavy load roller linear guide

For Vertical machining center

Batch supply for famous companies

Machine type:

VMC500、650、850、855、1160

Characteristics:

High speed: Movement speed 48m/min, rotation rate 3000r/minBall

Accuracy: Ball screw: P2,P3

Linear guide Accuracy: 2, 3

Series : Diameter: 32、40

Lead size: 12、16

Linear guide: GZB35、GZB45

For CNC lathe with oblique lathe bed

Batch supply for famous companies

Machine type:

32K、40K

Characteristics:

High speed: Movement speed 36m/min,rotation rate 3000r/min

Accuracy: Ball screw: P3

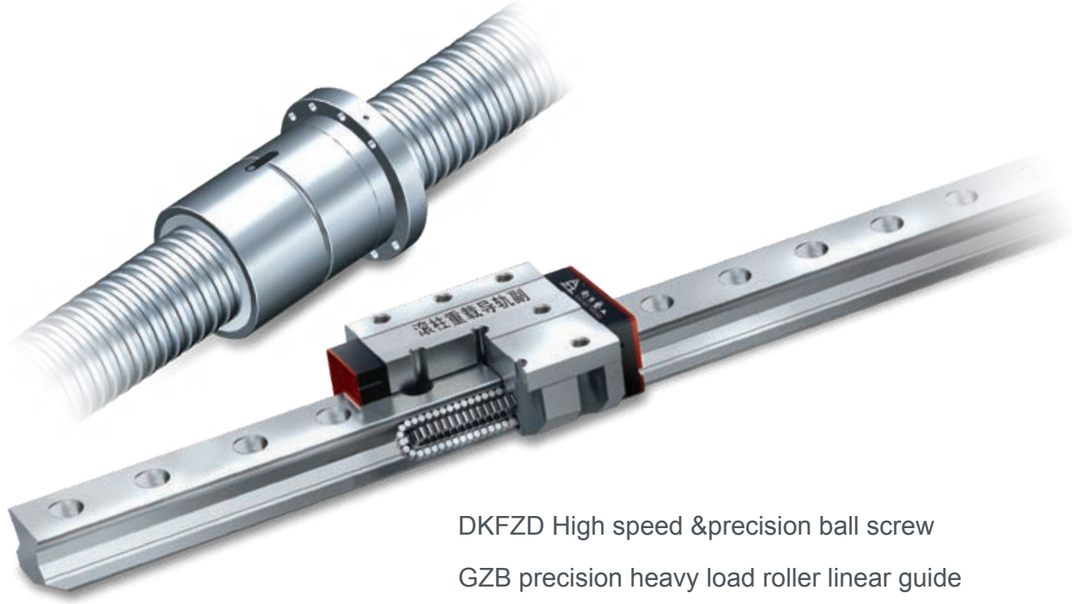
Linear guide accuracy: 3

Series: Ball screw diameter: 25、32、40

Ball screw lead size: 10、12、16

Linear guide: GZB25、GZB30、

GZB35、GZB45



DKFZD High speed &precision ball screw

GZB precision heavy load roller linear guide

For gantry machining center

Batch supply for famous companies

Characteristics:

High speed: Movement speed 20m/min,rotation rate 2000r/min, Ball screw can be made into a hollow strong cooling structure

Accuracy: Ball screw:P2, P3 Linear guide: 2, 3

Series: Diameter: 50、63、80、100、125、160

Lead size: 10、12、16、20、25、30

Linear guide: GZB45、GZB55、GZB65

Independent research and development

Won the second prize of science and technology of Chinese Machinery Industry in 2013

Won the top ten product quality awards of Chinese machine tool industry association in 2017

Precision ball spline

Product specification:

Φ16-Φ250

Product specification:

High speed, High accuracy:

Rolling friction instead of sliding friction, flexible movement, low energy consumption, high movement speed, preload to eliminate clearance, high accuracy.

Heavy load, Long life:

The spline shaft and nut are made of high-quality alloy steel. The hardness of thread way is over HRC58, with heavy load and long service life. The maximum static torque is 33KNm and the maximum static load is 421.5KN

Product specification:

Semiconductor equipment, tire machinery, monocrystalline silicon furnace, medical rehabilitation equipment.

Won the third prize of science and technology in Jiangsu Province

GGY Arc guide

Characteristics:

Four direction equal load:

Inherit advantages of four direction equal load of GGB type

High degree of serialization:

It can realize circular arc or circular motion of any diameter. And we can providestainless steel arc guide.

Replace slewing ring:

The arc guide, which is made up of several segments of arc guide ways, can realize infinite circular motion instead of slewing bearing.

Convenient to install and maintain:

It is easy to assemble and disassemble by bolt installation

Applications:

Solar cell equipment, health equipment, medical machinery

Large heavy ball screw

Large: Max. single to 10m, joint to 19m.

Heavy load: Dynamic load rating: 126ton,Static load rating: 595ton

Series: Diameter of ball screw: 63,80,100,120,160,200

Short delivery time: 30 days

Industrialization: Industrialization base of ball screw

Applications:

It is widely used in large-scale gantry boring and milling machine, composite machining center, aerospace, large machinery lifting equipment, large ship locks, forging equipment, metallurgical.
equipment, hydraulic equipment, large aircraft ships, large power generation equipment and other fields.

Introduction of Product design, manufacturing and testing technology:

Length and heavy load have always been an important problem to be solved in the manufacture of large and heavy load type ball screw. This series of products have conquered the design, heat treatment, straightening, thread way forming and dynamic detection technology. In the structural design, the product adopts the design structure with multi-path and large diameter ball cycle circuit, with the maximum rated dynamic load rating of 126 tons and the maximum static load rating of 595 tons. Nanjing Technical Equipment Manufacture Co.,Ltd. has put into use a series of equipment, such as 10 meter large lathe, 10 meter hard milling machine, 10 meter large grinder, 10 meter medium frequency quenching machine, 10 meter large straightening machine, 10 meter laser measuring instrument for stroke accuracy and so on, taking the lead in establishing the first single 10 meter ball screw production line in China. Especially,the 10 meter laser measuring.
instrument for stroke accuracy has passed the calibration of Jiangsu Institute of Metrology and has been put into use. It solves the key.
technology in the dynamic detection process of a single 10 meter ball screw pair. The industrialization base of large and heavy load ball screw pair has been established.

Rotary nut assembly unit

The ball nut main drive is a revolution in the ball screw drive form. In the field of long travel, heavy duty and high-speed transmission, the rotary nut assembly unit will be your first choice

Rotating nut assembly unit features:

Low inertia:

Compared with the screw rotation as the active drive, the nut rotation as the active drive greatly reduces the moment of inertia of the mechanical movement system, improves the limit speed of the system, and is easy to achieve high-speed transmission, at the same time, it also make the selected motor power smaller.

High stiffness:

The bearing size arranged on the outer circle of the nut is larger than the ball screw rotation as the active drive; At the same time, as the ball screw does not rotate, there is no need to install bearings on the journal, and greater axial pretensile force can be applied to the ball screw, so that the stiffness of the complete set of ball screw is greatly improved.

Multi-nut drive:

Multiple rotary nut assembly unit can be mounted on a ball screw, and multiple tables are driven simultaneously or separately Sports don't interfere.

Simple design and installation:

The rotary nut assembly unit integrates multiple functional parts in one, simplifying design and facilitating installation and commissioning.

Others:

As ball screw does not rotate, there is no circumferential friction at the central auxiliary support, and there is no local heating problem. When the positioning accuracy is high and the influence of temperature rise is considered,the ball screw hollow cooling structure is used, the cooling pipe joint is easier to arrange and install because the ball screw does not rotate.

Planetary ball screw

Product Specifications:

Diameter Ø30, Ø39, Ø48, Ø60, leads 10, 15, 20

Product features:

Large load and high rigidity:

The rolling element is in line contact with the ball screw raceway

High speed and acceleration:

There is no reverse circulation device which can achieve higher moving speed and acceleration of ball screw

High accuracy retention:

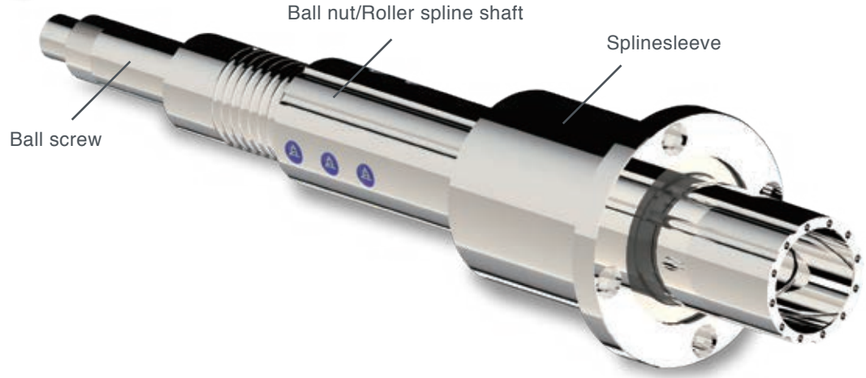
Hardness after quenching is HRC58 or above

Field to use:

Servo motor cylinder

Servo press core components

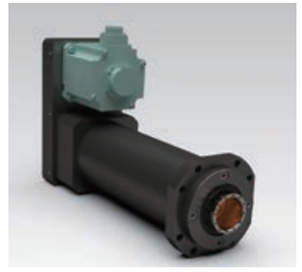
Heavy duty ball screw spline compound unit



★High load ★Low noise ★High precision ★Compact structure

roduct introduction

The rolling spline composite unit of ball nut is a new type of rolling functional component developed for the application field of automatic and intelligent production line. It is mainly composed of precision ball screw, ball nut/rolling spline shaft, rolling spline sleeve, etc.



The product is mainly used in servo press, through the integration of precision ball screw nut and ball spline shaft, simplify the press structure, save the press cylinder space;

The screw and nut structure adopts high load design to meet the demand of large tonnage of press; The ball spline pair is used to prevent rotation, rolling friction during operation, flexible action, low noise; The lead screw and nut raceway are precision grinding machining with high feed accuracy.

Nominal type	TG50	TG60	TG80	TG100	TG120
Ball screw diameter (mm)	32	40	50	75	80
Axial dynamic load rating(kN)	58	80	106	131	208
Axial static load rating(kN)	112	162	255	412	583
Lead(mm)	≥400				

MZA series servo cylinder

As a high-efficiency and energy-saving component, MZA series servo cylinder is widely used in semiconductor equipment, PCB production testing equipment, automatic welding equipment, logistics transmission equipment, precision testing equipment and other automation industries.

Special points:

Lightweight design:

The base and shell of the servo cylinder are made of aluminum alloy, which greatly reduces the weight of the body.

Embedded raceway design:

The hardened steel raceway is embedded in the aluminum alloy base, which has the advantages of high load bearing and high rigidity while having the characteristics of light weight.

High precision:

Raceway adopts double arc design to achieve four-point contact, which can minimize the deformation caused by load changes and realize high-precision positioning.

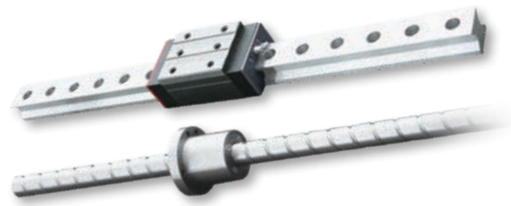
Compact structure:

Slider nut integrated design, compact structure, greatly saving space.

Fully sealed design:

The steel belt is fully sealed to improve the dust-proof performance of the servo cylinder.

Anticorrosive Ball Screw and Linear Guide



Ordinary material + white coating treatment

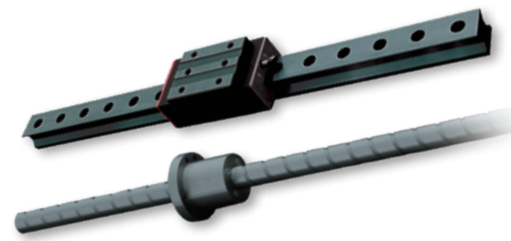
Features:

Carrying Capacity: ★★★★★

Corrosion resistance: ★★★

Application:

General corrosion requirements occasions



Ordinary material + black coating treatment

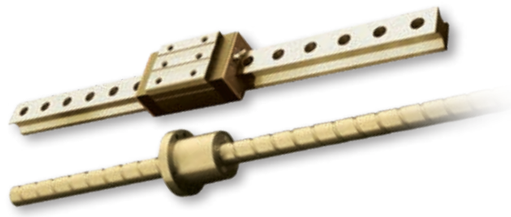
Features:

Carrying Capacity: ★★★★★

Corrosion resistance: ★★★★

Application:

Occasions with slightly higher anti-corrosion requirements



Martensitic stainless steel material

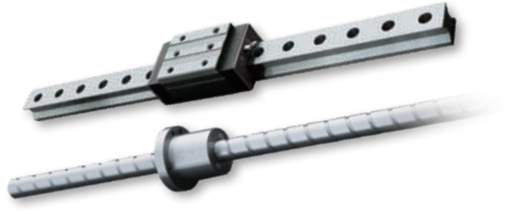
Features:

Carrying Capacity: ★★★★

Corrosion resistance: ★★★

Application:

After special treatment, it can be suitable for Vacuum environment, high/low temperature environment. Solid lubrication is suitable for Vacuum environment; After filling with high and low temperature grease, it is suitable for high/low temperature environment



Austenitic stainless steel material

Features:

Carrying Capacity: ★★

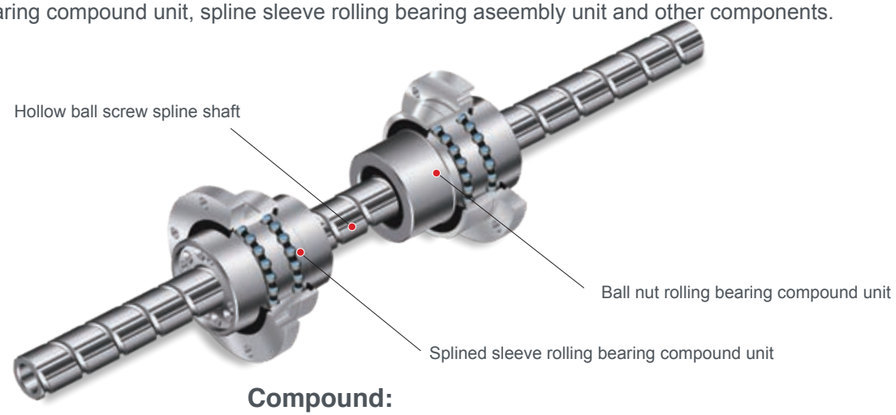
Corrosion resistance: ★★★★★

Application:

Extremely low temperature environment and non-magnetic occasions

DKG(J)
Ball screw and ball spline compound unit

The ball screw and ball spline compound unit is a new type of compound developed for the application field of automatic and intelligent production line with rolling function parts, the products are widely used in horizontal multi-joint robot (SCARA) Z axis, glue dispenser, welding machine, automatic loader, automatic testing equipment and machining center ATC (automatic tool change) and other rotating motion and straight mechanical combination device for linear motion. Products are mainly composed of hollow screw spline shaft, ball nut rolling bearing compound unit, spline sleeve rolling bearing aseembly unit and other components.



Compound:

The ball screw spiral raceway and ball spline (straight) raceway are cross-designed on the same shaft, and the ball nut and spline sleeve are respectively integrated with the rolling bearing height. Through the rotation or stop of the ball nut and spline sleeve, the ball spline shaft can be rotated, straight and spiral in 3 forms of compound movement.

Lightweight, low inertia:

Ball screw spline shaft adopts hollow design, the overall weight is light; The ball nut and spline sleeve are integrated with the bearing design, making the radial size of the ball nut rolling bearing compound unit and the spline sleeve rolling bearing compound unit small enough and the moment of inertia extremely low.

High speed, low noise:

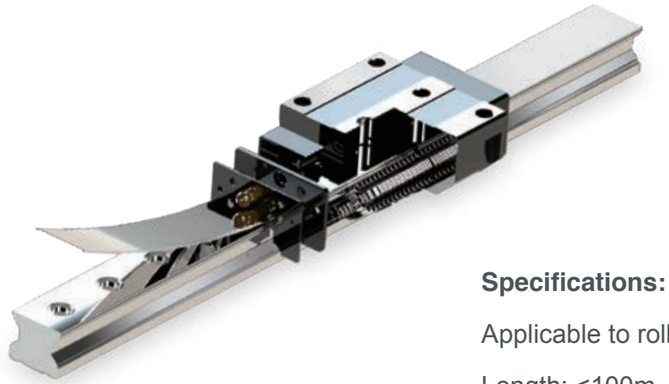
Ball screw selection of large lead design, coupled with the rotating unit moment of inertia is very low, low noise at high speed movement.

Easy to install:

The two ends of the ball nut rolling bearing composite unit and spline sleeve rolling bearing composite unit are provided with standard driving pulley connecting parts, which is convenient for user selection and easy installation.

High seal and dust proof steel linear guide

The use of dust-proof steel can make the surface of the guide rail more flat, the end seal scraping effect is better, no outside matter accumulation, prevent smaller particles from getting inside the slider.



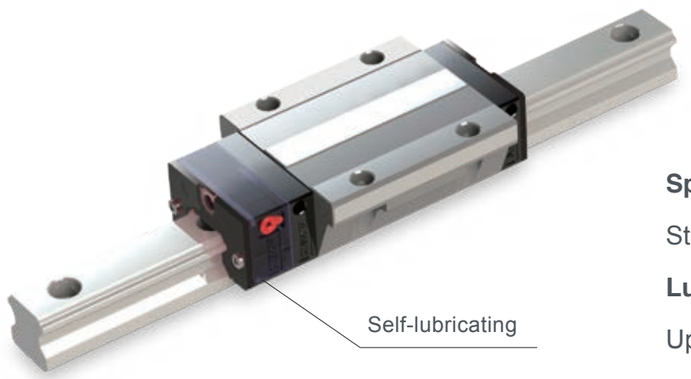
Specifications:

Applicable to rolling heavy linear guide GZB30-65

Length: <100m

Self-lubricating linear guide

The linear guide is equipped with a self-lubricating mechanism to automatically send lubricating oil to the raceway of the linear guide rail to provide long-term lubrication for the linear guide rail.



Specifications:

Steel ball GGB20-GGB55

Lubrication life:

Up to 5 years or 10,000 km without lubrication

Presion Rolling guide

Introduction

Linear guideway is as a kind of precision linear guiding parts, it has beenmore and more widely used in CNC machinery, automatic productionline and etc. because of its heavy-load, high-accuracy, high-speed, low-abrasion, reliability and standardization characteristics.

Linear guideway is one of our Yigong main products. After over 20 yearsproduction and development, it has GZB, GGB, GLB, GGD, GGC, GGY, GZD etc. about hundreds of specs and models products presently. Wetake self-innovation constantly, improve the technology, upgrade theinternational market competition, and get patent for roller guide (patentno.ZL200520073585.6) etc. total 14 items. We get five technologyimprovement awards from Nanjing city, Jiang province and MachineryAssociation early or late. Roller guide R-guide, mini guide etc. areas high-tech product of Jiangsu Province and national emphasis newproduct. After many years' efforts, We have:

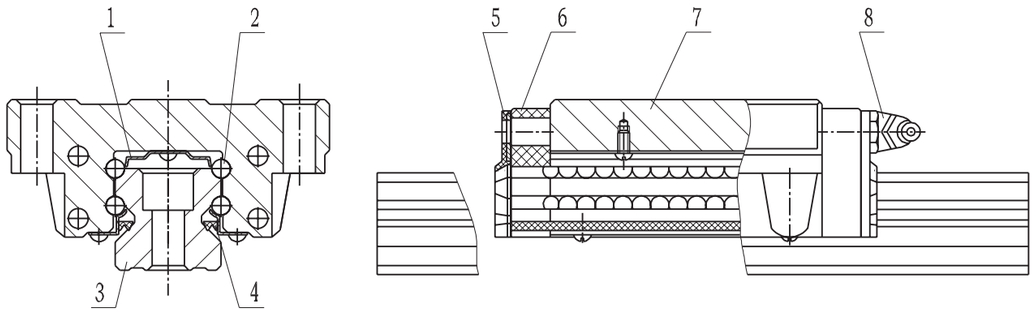
- ◆ Large: Max. rail size 125, max. single length: 6m
- ◆ Heavy load: mass production of roller guide size 35, 45, 55, 65, 85,100 and 125, max. single block load capacity is 192 tons.
- ◆ High accuracy: High accuracy, good quality and performance basedon many years' advanced production and test technologyd
- ◆ Short delivery: Big stock, within 7 days

1. Configuration and feature

● Structure (GGB type)

Linear guideway consists of ral, block, balls, return mechanism, retainer,sealing

gasket etc.(see Fig-1). When the block moves in a linear directionrelative to the rall, balls run along four raceway grooves which have beenquenched and precisely finished. In the top of the block, balls again passthrough the returm mechanism into reciprocating hole then into racewayrepeatedly. The return mechanism has rubber-sealing gasket on bothsides to eliminate dust and keep foreign material away.



1.ball retainer 2.ball 3.rail 4.side seal gasket
5.end seal 6.return mechanism 7.Block 8.oil cup

Fig-1

2. Advantages

- ◆ By placing appropriate balls between rail and block, friction between the block and the rail changes from sliding friction to rolling friction,which greatly reduced the motion friction resistance. Thereby:

a.The difference between dynamic and static friction is small. It benefits to raise response speed and sensibility of CNC system.

b. The driving power is greatly reduced,which is only 1/10 of the general machinery.

c. The friction resistance reduce 40 times compared to V-shape cross roller guide.

d. Suitable for high-speed linear motion, the instantaneous speed is 10 times of than sliding guide.

e. High positioning accuracy and high repetitive positioning accuracy

- ◆ It can achieve no clearance motion, raising the running rigidity of the mechanical system.
- ◆ It has error homogenization effect when using in double guideways,which lower the processing accuracy requirements of rail fixing surface and save the cost of manufacture.
- ◆ Suitable ratio of radius groove of raceway sectional plane assured that contact force turns small and carrying capacity and rigidity could be also raised greatly Value of rolling fiction is less than that of double-arc raceway.
- ◆ Surface hardness process makes guide way good calibration and core part keep good mechanical characters.
- ◆ Simplfiy the design and manufacture of mechanical structure.

3. Accuracy

Because of the error homogenization effect of the linear guide ways, when two or moresetsof linear guide ways are used on the same surface,higher moving accuracy can be attained even using lower mounting accuracy Normally products quality can be improved by 20%-50%.Accuracy grades are recommended forkinds ofmachine tools and machinery equipment, seeTab-1

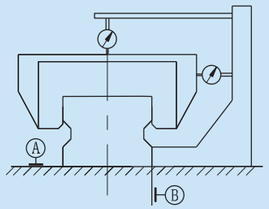
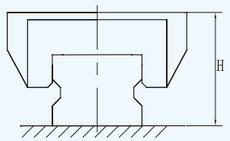
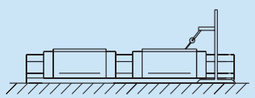
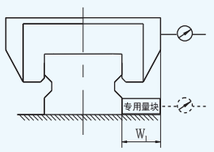
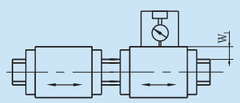
Tab-1

Machine tool and machinery type		Coordinate	Accuracy grade			
			2	3	4	5
CNC machine	Late machine	x	√	√	√	
		z		√	√	√
	Milling machine machine center	x、y	√	√	√	
		z		√	√	√
	Coordinate boring machine	x、y	√	√		
	Coordinate grinding machine	z		√	√	
	Grinding machine	x、y	√	√		
		z	√		√	
	Electrical process machien	x、y	√	√		
		z			√	√
	Precesion cutting machine	x、z			√	√
	Graph plotter	x、y		√	√	
	Precision worktable	x、y		√		
	Common machine	x、y		√		
		z		√	√	
	General machine				√	√

The accuracy and test methods of the YiGong brand rolling linear guide pair are formulated in accordance with the mechanical industry standard of the people's Republic of China JB/T7175.4-2006 "Technical conditions for acceptance of the rolling linear guide pair" and JB/T12603.2-2016 "Roller linear guide pair part 2: accuracy test", which is equivalent to the foreign counterparts' standard.

According to the range of use, the rolling linear guide pair is divided into five accuracy levels, namely, 1, 2, 3, 4, 5, and the first grade has the highest accuracy, which is reduced step by step. The inspection items of each grade and the allowable differences are shown in Table-2 (GGB, GZB, series in the table)

Tab-2

Items	Diagram	Inspection item	Tolerance					
1		The parallelism of the block movement to the datum of the guide: a) parallelism to the surface A of the guide rail b)parallelism to the surface datum B of the guide rail	Rail length mm	Accuracy grade um				
				1	2	3	4	5
			⩽500	2	4	8	14	20
			＞500-1000	3	6	10	17	25
			＞1000-1500	4	8	13	20	30
			＞1500-2000	5	9	15	22	32
			＞2000-2500	6	11	17	24	34
			＞2500-3000	7	12	18	26	36
			＞3000-3500	8	13	20	28	38
			＞3500-4000	9	15	22	30	40
			＞4000-4500	10	16	23	32	42
			＞4500-5000	11	17	24	33	43
			＞5000-5500	12	18	25	34	44
			＞5500-6000	13	19	26	35	45
2		Dimension tolerance of height H	Type	Accuracy grade um				
				1	2	3	4	5
			15、16、20 25、30、35	±5	±12	±20	±40	±80
			45、55	±8	±15	±25	±50	±100
			65、85 、100	±15	±20	±30	±60	±120
			125	±20	±25	±35	±70	±130
3		The variation of the top height H of multiple blocks paired with rails on the same surface	Type	Accuracy grade um				
				1	2	3	4	5
			15、16、20 25、30、35	3	5	7	15	30
			45、55	3	5	7	15	30
			65、85、100、125	5	7	10	20	40
4		The dimension deviation of the distance W1 between the block side and the guide side datum on the same side as the guide side datum (applli-cable to the base rail only)	Type	Accuracy grade um				
				1	2	3	4	5
			15、16、20 25、30、35	±5	±10	±20	±40	±150
			45、55	±10	±15	±25	±50	±160
			65、85、100	±15	±20	±30	±60	±170
			125	±20	±25	±35	±60	±180
5		The change of the datum Type W1 between the side of mul-tiple blocks and the side of the rail on the same rail (only ap-plicable to the block rail)	Type	Accuracy grade um				
				1	2	3	4	5
			15、16、20 25、30、35	5	7	10	15	30
			45、55	8	10	12	20	30
			65、85、100、125	10	12	15	25	40

Notes:

Because raceway of rail is finished by fixing rail with bolts on a special fixture during the grinding process. Curve ill possibly occur in free state

So the rail should be fixed on special table to measure and inspect.

4. Linear guide lubrication

The main purpose of lubrication of linear guide pair is to reduce friction and wear to prevent overheating, damage its internal structure, and affect the movement function of guide pair.

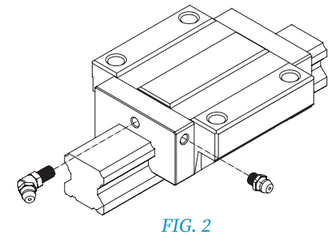


FIG. 2

● Introduction to lubrication

The sliding block of the linear guide pair is pre-loaded with lithium grease under normal conditions.If forced tubing lubrication is used, it is recommended to use lubricating oil with a viscosity of about ISO VG32 ~ 150; If forced tubing lubrication is used, you can inform our company in advance, and the linear guide will not be injected with lubricating grease or handled appropriately according to requirements.

● Oil nozzle position

Install oil nozzles at the front or back end of the slide block for manual oil injection according to customer requirements. Install oil nozzles (usually straight oil nozzles) at the oil holes reserved on the side of the rolling slide block to provide lateral oil injection. It is recommended that the lateral oil injection position be on the non-reference side, but it can be placed on the reference side if there is special need. Please contact us if you have the above requirements for lateral oiling. Using a guide rail pair that automatically lubricate grease by tubing, you can choose to install tubing joints according to the type of connecting tubing.

● Lubricating joint type

Type of nozzle :

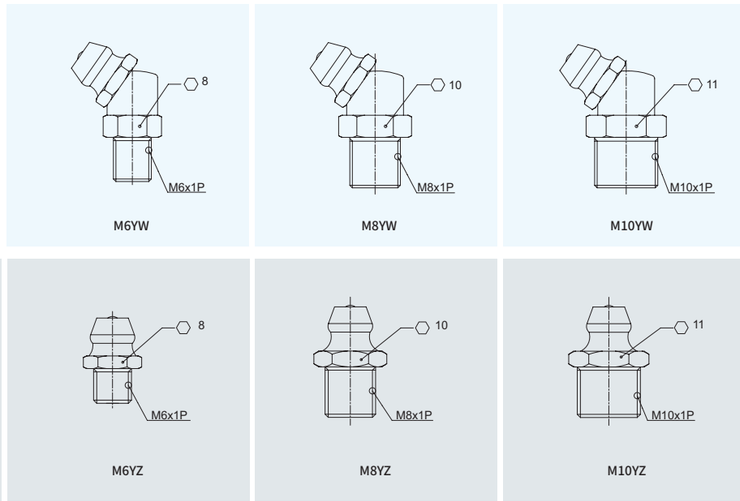


FIG. 3

Type of pipe joint:

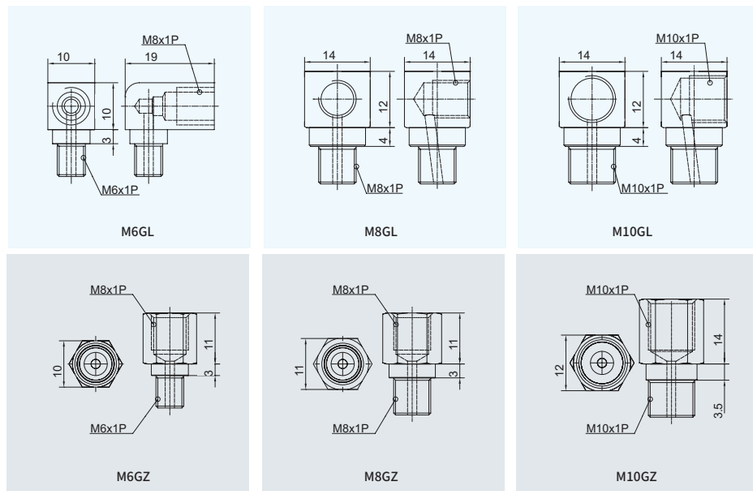


FIG. 4

● Slider lubrication joint selection specification table

Tab -3

Specification		Nozzle form		Pipe joint form	
		Standard	Select and use	Select and use	Select and use
GGB15/16	/	M4YZ	/	/	/
GGB20	/	M6YW	M6YZ	M6GL	M6GZ
GGB25	GZB25				
GGB30	GZB30				
GGB35	GZB35				
GGB45	GZB45	M8YW	M8YZ	M8GL	M8GZ
GGB55	GZB55				
GGB65	GZB65				
GGB85	GZB85				
/	GZB100	M10YW	M10YZ	M10GL	M10GZ
/	GZB125				

● The amount of lubricating oil and the rate of oil supply for each type of slider

Tab -4

Specification	Amount of grease for the first lubrication (cm^3)		Amount of grease replenishment(cm^3)		Lubricating oil for the first time (cm^3)	Fuel delivery rate (cm^3/hr)
	Standard type slider	Extended slider	Standard type slider	Extended slider		
GGB15/16	1	/	0.4	/	0.6	0.2
GGB20	2	3	0.7	1	0.6	0.2
GGB25	3.4	5	1.2	1.8	0.9	0.3
GGB30	5.5	8	1.8	2.7	0.9	0.3
GGB35	8	11.5	2.7	4	0.9	0.3
GGB45	16	23	5.0	7.5	1.2	0.4
GGB55	27	38	9.0	12	1.5	0.5
GGB65	51	76	17.0	26	1.8	0.6
GGB85	100	145	34.0	45	2.4	0.7
GZB25	4.5	5.5	1.5	1.8	0.9	0.3
GZB30	7	9	2.3	3	0.9	0.3
GZB35	9.5	12.5	3.0	4	0.9	0.3
GZB45	17	22	5.5	7.5	1.2	0.4
GZB55	26	35	9.0	12	1.5	0.5
GZB65	51	65	17.0	21	1.8	0.6
GZB85	/	90	/	30	2.1	0.7
GZB100	/	135	/	45	2.7	0.9
GZB125	/	210	/	70	3.3	1.1

● Lubrication frequency

Although the rolling linear guide pair is sealed, the internal lubricating oil will still be lost during operation, so it is necessary to lubricated at appropriate intervals according to the conditions of use. Grease lubrication is recommended every 100km run, or grease confirmation every 3 to 6 months; Lubricating oil lubrication Check the lubricating oil level in the mandatory lubricating oil tank in time.

5. Self-lubrication of rolling linear guide pair

1. Self-lubricating linear rolling guide pair -ZR accessories

● Structure principle

ZR fittings are installed at one end of the slide block, the fittings are provided with an oil storage device and a lubrication mechanism, the oil storage device is packaged with a viscosity grade of ISO VG680 lubricating oil at the factory, and provides appropriate lubricating oil to the lubricating mechanism through the capillary principle, and the lubricating mechanism sends the lubricating oil to the raceway of the guide rail to provide sliding for the rolling linear guide rail pair, achieving up to 5 years or 10,000 kilometers without lubrication.

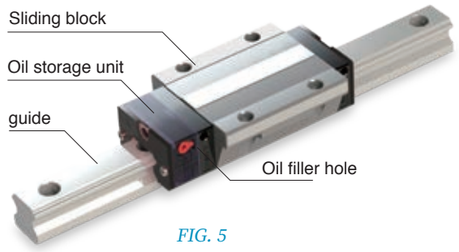


FIG. 5

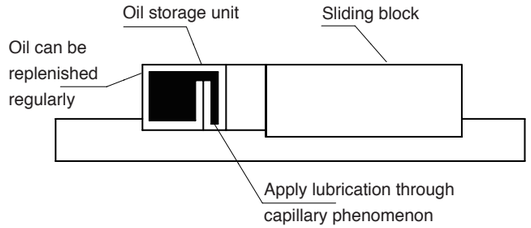


FIG.6

● Advantages

◆ Reduce lubrication cost

Save the lubrication system, equipment and reduce the cost of lubricating oil.

◆ Has environmental protection significance

Avoid oil spill pollution, suitable for higher environmental requirements of the use of occasions.

◆ Long service life, easy to replenish oil

After reaching life, it is very convenient to replenish the same lubricating oil into the oil storage device, thus achieving a longer service life.

◆ Flexible installation, no direction limit

The rolling linear guide pair can be installed at any Angle to achieve normal lubrication.

＊ Precautions

◆ Lubricating oil storage device can be added to the same viscosity of ISO VG680 lubricating oil, but must pay attention to the compatibility of lubricating oil

◆ The use temperature of this product is -10℃ to 60℃, if beyond this range, please contact us.

◆ At present, self-lubricators are widely used in GGB20~55 specifications.

◆ Below are the pictures and tables according to "Self-lubricating Illustrations and data sheets"

● Size table

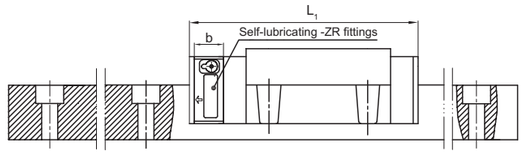


FIG. 7

Tab-5

Type	Type	mounting dimension L_1 (mm)	ZR Accessory Size b (mm)
GGB20	normalized form	92.3	17
	lengthened type	107	
GGB25	normalized form	100.8	17
	lengthened type	120	
GGB30	normalized form	115	17
	lengthened type	137	
GGB35	normalized form	127.6	17
	lengthened type	153	
GGB45	normalized form	156.5	20.5
	lengthened type	185.3	
GGB55	normalized form	186.5	20.5
	lengthened type	226.5	

2. self-lubricating linear guide -GR accessories

● Structure principle

GR accessories refer to porous polymer material oil storage accessories, mounted at both ends of the slide block, through contact with the guide track.In the process of use, there will be oil seepage to lubricate the guide rail raceway.

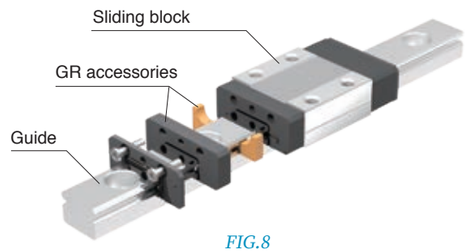


FIG.8

6. The sealing of the rolling linear guide pair

As the application range of rolling linear guide is increasing, all kinds of working conditions and occasions need to be used, in order to meet the sealing and protection requirements of different customers, the following sealing methods are specially designed for selection, please distinguish when ordering:

Tab -6

Seal code	Sealing mode	Application situation
No marks	End seal + side seal	Conventional sealing situation
DD	Double end seal + side seal	There are dust, wood chips, dust and other occasions
ZZ	End seal + side seal + metal scraper	There are iron filings, impurities and other occasions
KK	Double end seal + side seal + metal scraper	There are water mist, iron filings, impurities and other occasions

1.Slide seal

1.1 End seal

The end seal is the seal of the end face of the slide block to prevent iron filings or foreign matter from entering the inside of the slide block from the end face of the slide block during operation. At the same time, double layer end seal can be selected to strengthen the sealing performance.

1.2 Side Sealing

The side seal is the dustproof seal at the bottom of the slide block, which is in contact with the side of the guide rail to prevent iron filings or foreign objects from entering the inside of the slide block from the bottom of the slide block.

1.3 Metal scraper

The metal scraper is located on the outer side of the end seal and is made of stainless steel, which can prevent high temperature iron filings or processing sparks from contacting the seal directly, and remove large foreign objects in advance to improve the sealing effect.

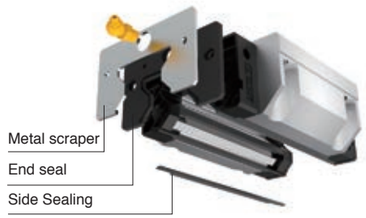


FIG. 9

2.Guide rail seals

2.1 Countersunk gland

To prevent iron scraps or foreign objects from accumulating in the mounting holes of the guide rail, press the countersunk hole gland into the mounting holes of the guide rail after locking the screws, so that the mounting holes and the top surface of the guide rail are in the same plane to prevent foreign objects from entering the slide block.Place the flat metal gasket on the gland, and hit the metal gasket with a plastic hammer many times, and knock the gland flat with uniform force for many times. Do not use brute force to knock, to prevent the countersunk gland from being skewed due to uneven force.At present, the countersunk gland is made of ABS material, and the metal gland (copper) is optional.

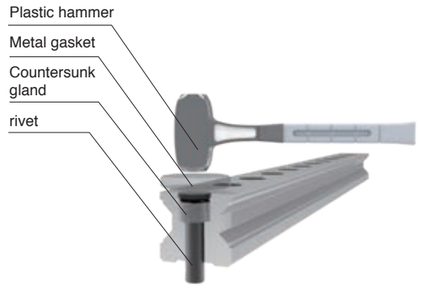


FIG. 10

2.2 Protective steel belt

The protective steel belt can be used instead of the countersink gland, which makes the surface of the guide rail more flat, provides a higher level of sealing, and can prevent smaller particles from entering the inside of the slider, especially in the environment with high dust, iron filings or wood chips, the sealing form with protective steel belt is selected, and the use effect is more excellent.

The protective steel belt is easy to install and can be disassembled and used many times. The surface of the guide rail is smooth and smooth, improving the sealing effect, and it is beautiful and practical.

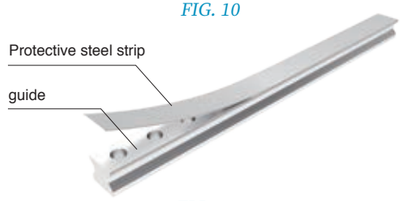


FIG. 11

7. Metal reverse precision ball linear guide pair

GGB series precision ball linear guide pair, equipped with metal reversing device, replacing the original plastic parts, with high strength, high stability and other characteristics.It can be used in high temperature and low temperature environment, and has higher reliability and longer service life than standard products under special conditions.

At present, we can provide specifications and models: GGB15-85.

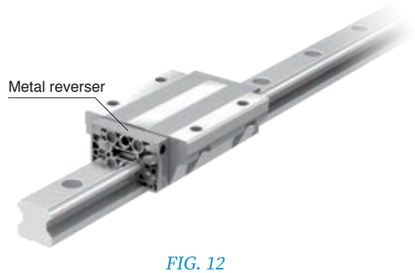
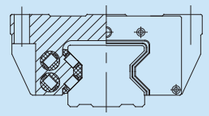
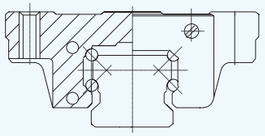
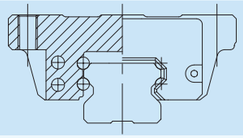
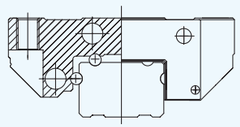
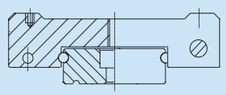
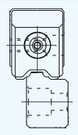
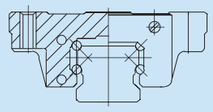
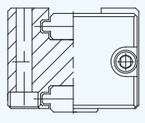


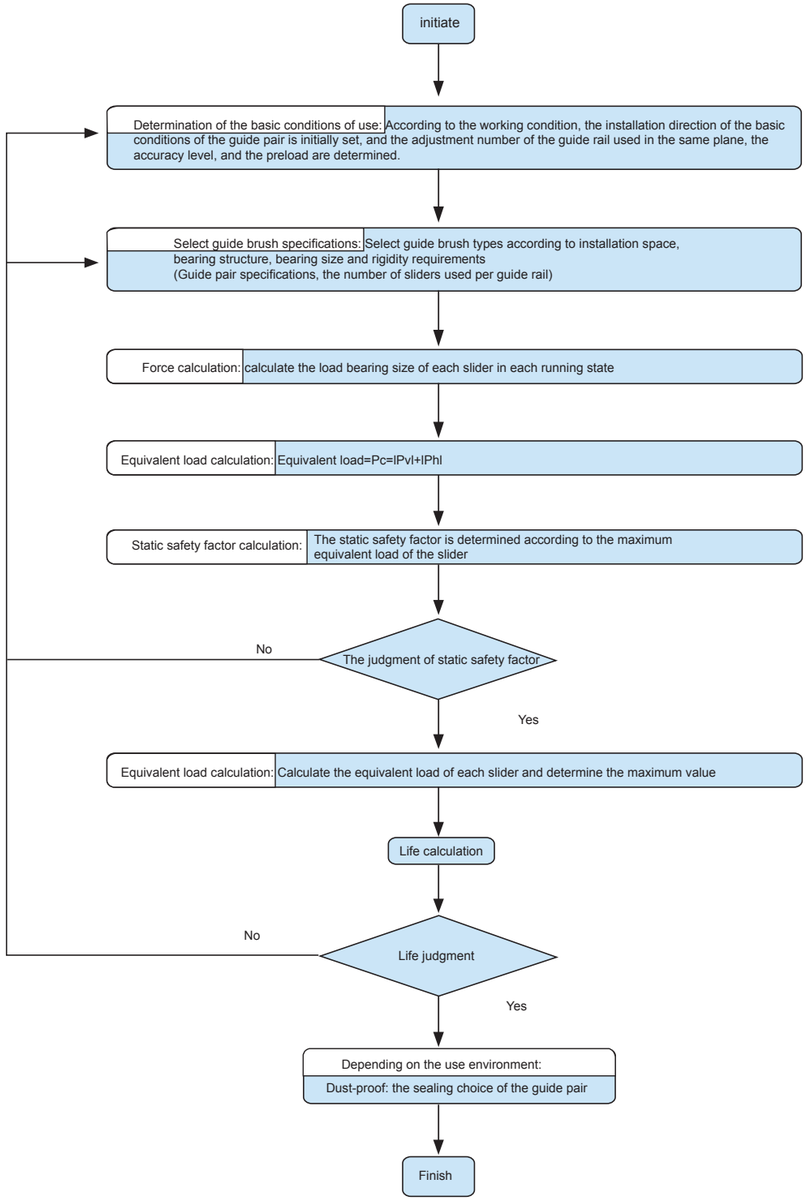
FIG. 12

8. The classification of linear guide

Tab -7

Diagram	Type	Name	Main application	Page number
	GZB	Roller heavy duty linear guide pair	Machining center NC lathe Grinding machine Heavy-duty machine tool	P42 ≀ P47
	GGB	Precision ball linear guide pair	Machining center NC lathe Handling device Electrical discharge processing machine Woodworking machinery Laser processing machinery Precision test nstrument packaging machinery Food machinery Food machinery Tool grinder Surface grinding machine	P48 ≀ P55
	GLB	Low assembly precision ball linear guide pair	Automatic device High-speed transport equipment Precision measuring instruments Semiconductor equipment	P56 ≀ P63
	GGD	Radial heavy duty rolling linear guide pair	Machining center NC lathe Grinding machine	P64 ≀ P69
	GGC	Miniature rolling linear guide pair	Semiconductor manufacturing unit Medical device Optical platform Inspection device Electric discharge wire cutting machine	P70 ≀ P73
	GGF	Separate rolling linear guide pair	Electric discharge machining machine Electric discharge wire cutting machine	P74 ≀ P75
	GGY	Rolling arc guide pair	Large transposition Control device Medical device Stage installation Vertical lathe	P76 ≀ P79
	GZD	Precision roller guide block	Heavy-duty machine tool Load handling device	P80 ≀ P82
	GZV	Precision roller cross guide pair	Precision platform Testing instrument Test device Assembly machine	P83 ≀ P87

9. Linear guide subselection flow chart



10. Static safety factor and life calculation

When calculating the bearing capacity of the slide block on the guide rail, it is necessary to determine the maximum impact load that the guide rail can withstand first, especially in cases where the starting and stopping impact is strong, the large cutting load and the guide rail load caused by the large cantilever are high, and the greater burden on the guide rail may be caused in some moments.

Therefore, when choosing the guide pair, we must first consider the selection of static safety factor f_s. (The reference value of static safety factor is shown in Table -8.)

式中 $$f_s = \frac{f_h \times f_t \times f_c \times C_0}{P_{max}}$$

f_h—hardness coefficient
f_t—Temperature coefficient (see Table 9)
f_c—Contact coefficient (see Table 10)
C_0—Static load rating
P_{max}—The maximum equivalent load of the slider

Tab -8

Machine	working condition	safety factor f_s off line
General machine tool	No vibration or shock	1—1.3
	There is vibration or shock	2—3
Demanding machine tool	No vibration or shock	1—1.5
	There is vibration or shock	2.5—7

11. Rolling linear guide pair rated life

The rated life refers to the total running distance that can be achieved by 90% of the same rolling guide pairs without surface spalling when they move one by one under the same conditions.

The calculation of the rated life of the rolling linear guide pair is based on the international standard ISO14728, which is different due to the actual working condition and load bearing, and its rated life (L) is calculated according to the basic rated dynamic load (C) and equivalent load (Pc) according to the following formula:

● Use of ball rolling guide pairs:

$$L = 50\left(\frac{f_h f_t f_c f_a}{f_w} \cdot \frac{C}{P_c}\right)^3 \quad (km)$$

● The use of roller guide pair occasions:

$$L = 100\left(\frac{f_h f_t f_c f_a}{f_w} \cdot \frac{C}{P_c}\right)^{\frac{10}{3}} \quad (km)$$

L - Rated life (unit: km)
C - Rated dynamic load (unit: kN)
P_c - equivalent load (unit: kN)
f_t- Temperature coefficient (see Table 9)
f_c- Contact coefficient (see Table 10)

● Calculation of life time

When the length of the stroke has been set, the rated life in hours

$$L_h = \frac{L \times 10^3}{2 \times l \times n \times 60} \approx \frac{8.3L}{l \times n} \ (h)$$

fa - Accuracy coefficient (see Table 11)
f_w- Load factor (see Table 12)
f_h- Hardness coefficient
f_h- (Raceway actual hardness HRC/58) $^{3.6}$
l - Length of travel (unit: m)
n - Number of cycles per minute (unit: min-1))

Because the technical requirements of the product stipulate that the raceway hardness shall not be less than HRC58, it is usually advisable to f_h=1

Tab-9 Temperature coefficient f_t

When temperature℃	<100	>100~150	>150~200	200~250
f_t	1.00	0.90	0.73	0.60

(Note:When temperature>80°C, please contact us to change the part to high temperature material in blocks.

Tab-10 Contact coefficient f_c

number of blocks per rail	Not close	2	3	4	5
f_c	1.00	0.81	0.72	0.66	0.61

(Note:When two or more two blocks are close,Calculation of life must consider contact coefficient.)

Tab-11 Accuracy coefficient f_a

Precision class	2	3	4	5
f_a	1.0	1.0	0.9	0.9

Tab-12 Loading coefficient f_w

Working conditions	No outer impact or low running speed which is less than 15m/min	No obvious impact or working in medium speed 15-60m/min	With foreign impact vibration,high speed which is more than 60m/min
f_w	1~1.2	1.2~1.5	1.5~3.5

12. Calculation of load and demonstration

● Load characters

Special structure enable linear guide way (LMG) handle equal load in vertical upside ,vertical downside, horizontal left and horizontal right four orienta tions.(See Fig-2)with many merits, such as heavy load, good rigidity, anti-vibration torque in three directions, linear guide way is widely used in kinds of loading machine tools etc.

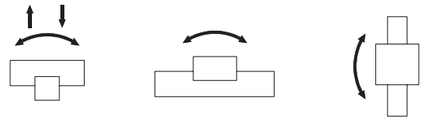


Fig-2

● Calculation of load acting on LMG

Several factors affect the calculation of loads acting on a linear guide way, such as structure forms (horizontal ,vertical, parallelism ...and so on), position of object's center of gravity, the thrust position, and the inertia force at the times of start and stop, moving friction etc.

Load of each block could be calculated in terms of engineering mechanics. After that, suitable rail and amounts of blocks are selected. For example: see Tab-9, the moving blocks on horizontal guide assembly ,W is the total load acting on these guides which are used on the same surface.

The calculation load P_c required to be worked as for the variable load over the total travel distance.

◆ Calculation load of subsection load:

$$P_c = \sqrt[3]{(P_1^3L_1 + P_2^3L_2 + \cdots + P_n^3L_n)/L}$$

P_n—load within relative stroke Ln (KN)

L_n—subsection stroke (km)

L—total stroke, equal to∑Ln (km)

◆ Calculation load of linear variation:

$$P_c=(P_{min}+2P_{max})/3 \quad (kN)$$

◆ Calculation load of sinusoidal loading in whole wave:

$$P_c=0.65P_{max} \quad (kN)$$

◆ Calculation load of sinusoidal loading in half wave:

$$P_c=0.75P_{max} \quad (kN)$$

◆ Calculation load of operating on vertical Pv and horizontal load Ph at the same time:

$$\vec{P}_c = \vec{P}_V + \vec{P}_h \ (kN)$$

◆ Calculation load with torque M and exterior load P0 at the same time:

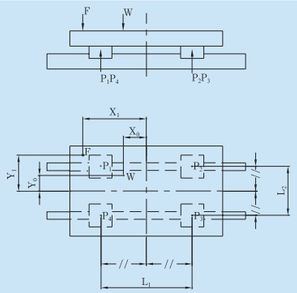
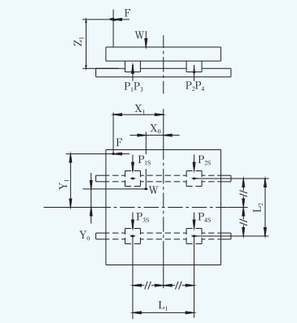
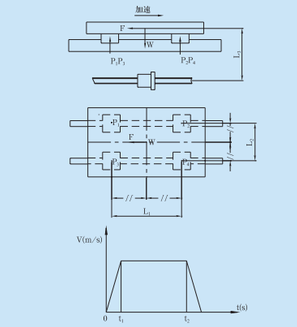
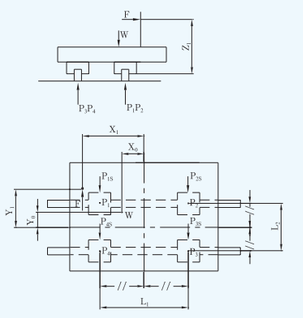
$$P_c = P_0 + C_0 \cdot \frac{M}{M_t} \quad (kN)$$

P_0—exterior load C_0—static load rating M—exterior torque

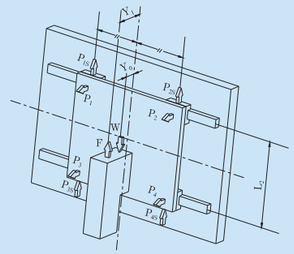
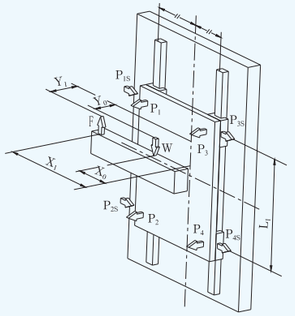
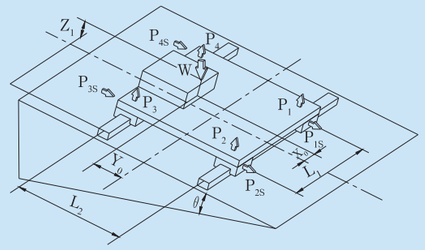
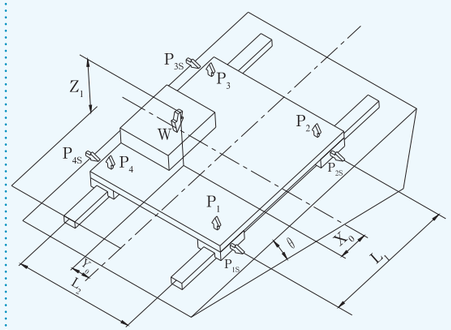
M_t—rated torque, respectively indicates M_A, M_B and M_C.

● Normal calculation formula of calculated loads on four blocks

Tab-9

Item	Layout	Calculated formula
1		$P_1=\frac{W+F}{4}+\frac{W\cdot Y_0+F\cdot Y_1}{2L_2}+\frac{W\cdot X_0+F\cdot X_1}{2L_1}$ $P_2=\frac{W+F}{4}+\frac{W\cdot Y_0+F\cdot Y_1}{2L_2}-\frac{W\cdot X_0+F\cdot X_1}{2L_1}$ $P_3=\frac{W+F}{4}-\frac{W\cdot Y_0+F\cdot Y_1}{2L_2}-\frac{W\cdot X_0+F\cdot X_1}{2L_1}$ $P_4=\frac{W+F}{4}-\frac{W\cdot Y_0+F\cdot Y_1}{2L_2}+\frac{W\cdot X_0+F\cdot X_1}{2L_1}$
2		$P_1=\frac{W}{4}+\frac{W\cdot X_0+F\cdot Z_1}{2L_1}+\frac{W\cdot Y_0}{2L_2}$ $P_2=\frac{W}{4}-\frac{W\cdot X_0+F\cdot Z_1}{2L_1}+\frac{W\cdot Y_0}{2L_2}$ $P_3=\frac{W}{4}+\frac{W\cdot X_0+F\cdot Z_1}{2L_1}-\frac{W\cdot Y_0}{2L_2}$ $P_4=\frac{W}{4}-\frac{W\cdot X_0+F\cdot Z_1}{2L_1}-\frac{W\cdot Y_0}{2L_2}$ $P_{1S}=P_{3S}=\frac{F\cdot Y_1}{2L_1}$ $P_{2S}=P_{4S}=-\frac{FY_1}{2L_1}$
3		Uniform acceleration（0~t_1）： $P_1=P_3=\frac{W}{4}-\frac{L_3}{2L_1}\cdot\frac{V}{g\cdot t_1}\cdot W$ $P_2=P_4=\frac{W}{4}+\frac{L_3}{2L_1}\cdot\frac{V}{g\cdot t_1}\cdot W$ Thereinto:g:gravitational acceleration; V:velocity; L3: The distance between ball screw axes Under uniform motion (t_1~t_2): $P_1=P_2=P_3=P_4=\frac{W}{4}$
4		$P_1=\frac{W}{4}+\frac{W\cdot X_0}{2L_1}+\frac{W\cdot Y_0+F\cdot Z_1}{2L_2}$ $P_2=\frac{W}{4}-\frac{W\cdot X_0}{2L_1}+\frac{W\cdot Y_0-F\cdot Z_1}{2L_2}$ $P_3=\frac{W}{4}+\frac{W\cdot X_0}{2L_1}-\frac{W\cdot Y_0-F\cdot Z_1}{2L_2}$ $P_4=\frac{W}{4}-\frac{W\cdot X_0}{2L_1}-\frac{W\cdot Y_0+F\cdot Z_1}{2L_2}$ $P_{1S}=P_{3S}=\frac{F}{4}+\frac{F\cdot X_1}{2L_1}$ $P_{2S}=P_{4S}=\frac{F}{4}-\frac{F\cdot X_1}{2L_1}$

Tab-9 continued

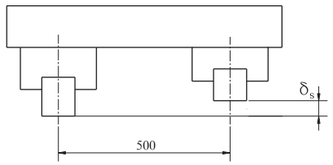
Item	Layout	Calculated formula
5		$P_1=P_2=\frac{F\cdot Y_1-W\cdot Y_0}{2L_2}$ $P_3=P_4=-\frac{F\cdot Y_1-W\cdot Y_0}{2L_2}$ $P_{1S}=P_{2S}=P_{3S}=P_{4S}=\frac{W-F}{4}$
6		$P_1=P_3=\frac{F\cdot Y_1-W\cdot Y_0}{2L_1}$ $P_2=P_4=-\frac{F\cdot Y_1-W\cdot Y_0}{2L_1}$ $P_{1S}=P_{3S}=\frac{FX_1-WX_0}{2L_1}$ $P_{2S}=P_{4S}=-\frac{FX_1-WX_0}{2L_1}$
7		$P_1=\frac{W\cdot\cos\theta}{4}+\frac{W\cdot\cos\theta\cdot X_0}{2L_1}-\frac{W\cdot\cos\theta\cdot Y_0}{2L_2}+\frac{W\cdot\sin\theta\cdot Z_1}{2L_2}$ $P_2=\frac{W\cdot\cos\theta}{4}-\frac{W\cdot\cos\theta\cdot X_0}{2L_1}-\frac{W\cdot\cos\theta\cdot Y_0}{2L_2}+\frac{W\cdot\sin\theta\cdot Z_1}{2L_2}$ $P_3=\frac{W\cdot\cos\theta}{4}-\frac{W\cdot\cos\theta\cdot X_0}{2L_1}+\frac{W\cdot\cos\theta\cdot Y_0}{2L_2}-\frac{W\cdot\sin\theta\cdot Z_1}{2L_2}$ $P_4=\frac{W\cdot\cos\theta}{4}+\frac{W\cdot\cos\theta\cdot X_0}{2L_1}+\frac{W\cdot\cos\theta\cdot Y_0}{2L_2}-\frac{W\cdot\sin\theta\cdot Z_1}{2L_2}$ $P_{1S}=P_{4S}=\frac{W\cdot\sin\theta}{4}+\frac{W\cdot X_0\cdot\sin\theta}{2L_1}$ $P_{2S}=P_{3S}=\frac{W\cdot\sin\theta}{4}-\frac{W\cdot X_0\cdot\sin\theta}{2L_1}$
8		$P_1=\frac{W\cdot\cos\theta}{4}+\frac{W\cdot\cos\theta\cdot X_0}{2L_1}-\frac{W\cdot\cos\theta\cdot Y_0}{2L_2}+\frac{W\cdot\sin\theta\cdot Z_1}{2L_1}$ $P_2=\frac{W\cdot\cos\theta}{4}-\frac{W\cdot\cos\theta\cdot X_0}{2L_1}-\frac{W\cdot\cos\theta\cdot Y_0}{2L_2}-\frac{W\cdot\sin\theta\cdot Z_1}{2L_1}$ $P_3=\frac{W\cdot\cos\theta}{4}-\frac{W\cdot\cos\theta\cdot X_0}{2L_1}+\frac{W\cdot\cos\theta\cdot Y_0}{2L_2}-\frac{W\cdot\sin\theta\cdot Z_1}{2L_1}$ $P_4=\frac{W\cdot\cos\theta}{4}+\frac{W\cdot\cos\theta\cdot X_0}{2L_1}+\frac{W\cdot\cos\theta\cdot Y_0}{2L_2}+\frac{W\cdot\sin\theta\cdot Z_1}{2L_1}$ $P_{1S}=P_{4S}=\frac{W\cdot Y_0\cdot\sin\theta}{2L_1}$ $P_{2S}=P_{3S}=-\frac{W\,Y_0\sin\theta}{2L_1}$

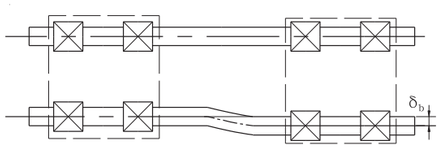
(We developed the special calculation software of load for linear guide, we can recommend you the right specs, according to your force condition, design etc.)

13. Operating Instructions of linear guide

● Accuracy requirements for mounting surface of basic parts of linear guide way:

δ_b :Parallelism tolerance of mounting side ref. surface;When δ_s is 500mm between two rail ways, it is recommended to install the allowable height tolerance of the two guide rails, and the other spans can be calculated proportionally according to this recommended value.

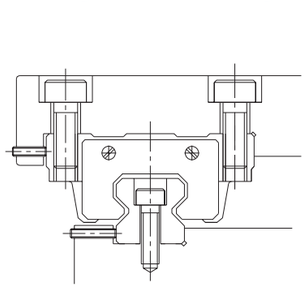




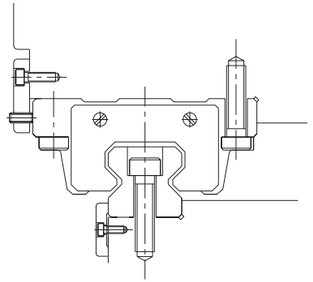
Unit:μm

Size	δ_s							δ_b						
	GGB				GZB			GGB				GZB		
	P_0	P_1	P	P_3	P_0	P_1	P	P_0	P_1	P	P_3	P_0	P_1	P
15/16	35	70	100	150	-	-	-	13	16	22	30	-	-	-
20	45	75	110	150	-	-	-	15	18	23	30	-	-	-
25	65	75	110	160	55	100	150	18	20	27	35	5	7	9
30	80	100	150	210	55	100	150	24	27	37	45	6	8	10
35	110	120	180	250	55	100	150	27	33	46	55	7	10	14
45	120	140	220	310	55	100	150	32	37	55	65	9	13	17
55	150	180	270	400	55	100	150	42	45	63	75	11	14	21
65	180	230	300	480	55	100	150	51	55	75	85	14	18	27
85	250	300	400	600	55	100	150	70	81	95	100	27	31	51
100	-	-	-	-	55	100	150	-	-	-	-	32	41	57
125	-	-	-	-	55	100	150	-	-	-	-	40	50	60

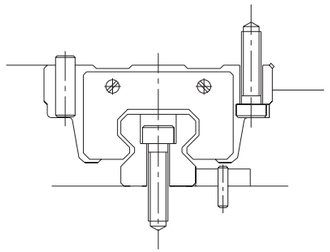
● Configuration of connecting datum plane of linear guide (See fig-3)



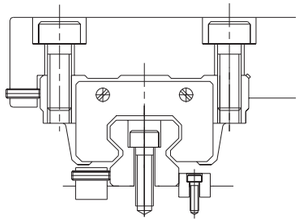
Fixed with tighten screw



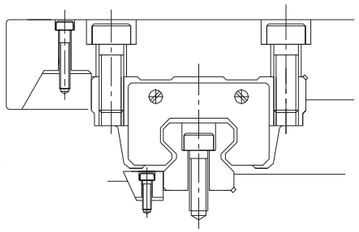
Fixed with push plate



Fixed with position pin



Fixed with tighten screw and position key

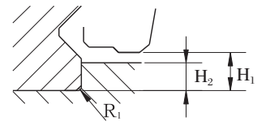


Fixed with tapper gib

Fig-3

● Shoulder height and chamfer type for mounting datum plane (See fig-4)

◆ Rail datum plane mounting



◆ Block datum plane mounting

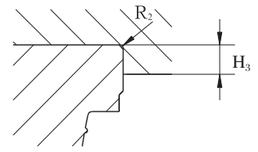


fig-4

◆ When fixing block and rail on the machine body and worktable, the chamfer of block and rail should be machined as value r which is shown in Tab.10 respectively or machine to be grooved so as to keep the chamfers of rails and block not to contact basic parts.

Tab-10 *Unit:mm*

spec	ChamferR1	ChamferR2	shoulder height(H_2)	shoulder height(H_3)	H_1
GGB16	⩽0.3	⩽0.3	3.5	3.5	4.3
GGB20	⩽0.5	⩽0.3	3.6	4	4.6
GGB25	⩽0.5	⩽0.5	4.5	5	5.5
GGB30	⩽0.8	⩽0.8	4.5	5	5.5
GGB35	⩽0.8	⩽0.8	7	7	8
GGB45	⩽0.8	⩽0.8	8	8	9
GGB55	⩽1	⩽1	10	11	11
GGB65	⩽1	⩽1	11	11	12
GGB85	⩽1	⩽1	11	13	12

Note: The H1 size of GZB specification is carried out according to P44-P47, the H1 size of GLB specification is carried out according to P58-P63, and the H2 size is at least 1~2mm smaller than the H1 size during design.

● Mounting and adjustment of linear guide

◆ Mounting methods and operating instruction

Handle with care to avoid bumping that may affect the linear accuracy of the guide rail .Do not remove the slider from the guide rail or push it back over the stroke. If the installation is difficult and the sliding block needs to be removed, the guide rail provided by our company can be used. (The guide rail is an assembly aid that is actually one size smaller than the guide rail. If necessary, connect the guide rail to the end of the guide rail and push the slider from the guide rail to the guide rail. When the guide rail is installed, push the slider from the guide rail to the guide rail, paying attention to the reference direction.)

◆ Mounting attentions

1) Find out the same group of guide pairs, the factory code is the same group of guide pairs;

2) Distinguish the reference guide pair from the non-reference guide pair, and the one with J after the factory code is the reference guide pair;

3) Confirm the datum surface of the guide rail and the slide block. The arrow points to the datum side of the guide rail, and the datum side of the slide block is the polished surface.

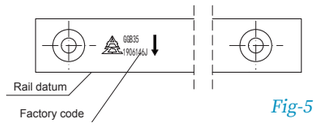
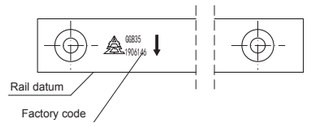
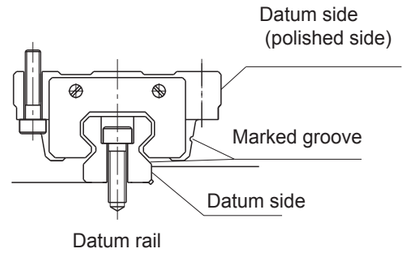


Fig-5



4) Recognize the reference side required for the installation of the guide pair.



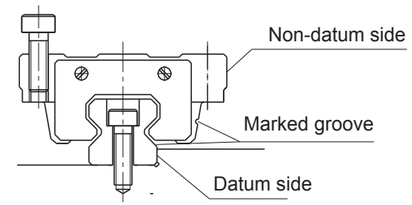
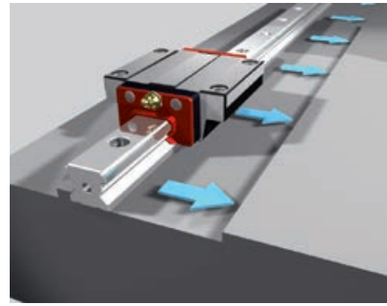


Fig-6

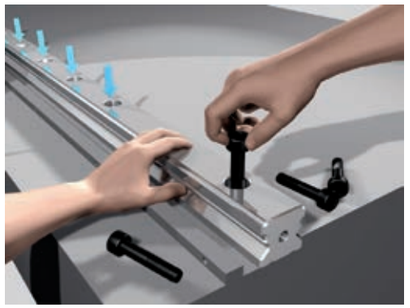
◆ Procedure of rail installation (see Fig-7)

(a) Check and remove all dirt from the mounting surface of the machine;

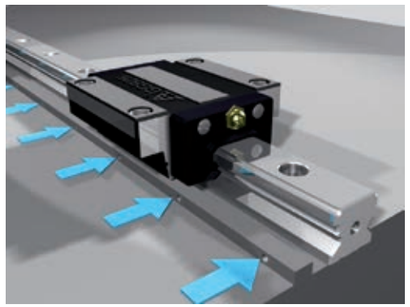
(b) Bring the guide way into close contact with the datum plane of bed;



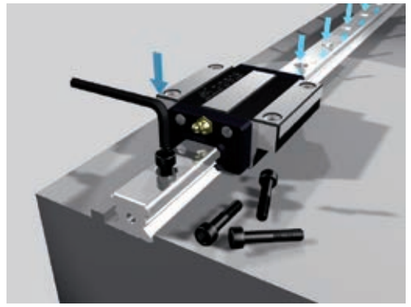
(c) Check position of screw correctly;



(d) Tighten the push screws sequentially to ensure close contact between the rail and the side datum plane;



(e) Tighten the mounting bolts.



(f) Tighten the push screws of the blocks one by one

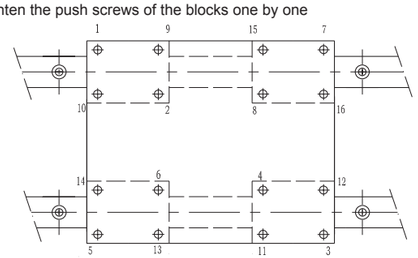


Fig-7

▲ Mounting methods of master guide (two methods shown below):

<1>.Use the U-type collet to tighten the side datum plane of the rail and bed, then tighten the mounting bolts(mated screw thread recommended) in sequence to the specified torque. (refer to Fig-8)

Fig-8

<2>.When there is no bed, fix one end of linear guideway, use a dial gauge and a straight edge to confirm the straightness of the side datum plane of the rail from one end to the other. Tighten the mounting bolts in sequence.

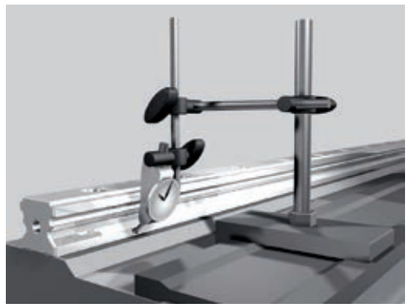


Fig-9

▲ Mounting methods of subsidiary LMG:

Shown as fig-10, fix magnet watch base on the block of master guide, pointer of dial gauge contacts on the side datum surface of subsidiary guide, read the parallelism from one end and tighten the subsidiary guide in sequence. In addition, methods shown in fig.8 and fig-9 could be referred to.

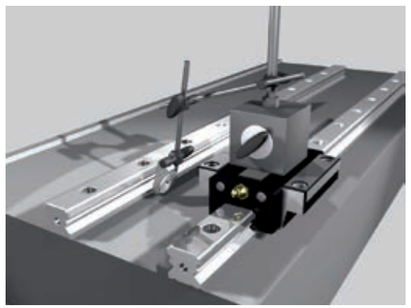


Fig-10

▲ Distinguish of Joint guide:

When using the joint guide, we use the same English capital letter represents the same series guide, consecutive Arabic number represents the joint sequence. Two sides (head joint with head) with the same Arabic letter (see fig-11)

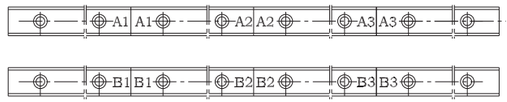


Fig-11

▲ When tighten the bolts, suggest using constant-torque wrench. Recommended torque value shown in Tab-11

Tab-11 *Unit:N.m*

Nominal dia.of screw (mm)	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24	M30
Torque value (N-m)	2.6 ~4.0	5.1 ~8.5	8.7 ~14	21.6 ~30.5	42.2 ~67.5	73.5 ~118	121 ~162	178 ~295	260 ~347	488 ~690	993 ~1244

After tighten the screws, if the top tap hole needs dustproof and seal, please use the tap hole cap packed together with the products.

14. Seal accessories of linear guideway

With the widely using of linear guideways, kinds of condition and situation will be used. In order to meet different customer's seal protection requirements, we designed below seal types to choose when ordering:

Seal code	Seal type	Application
No marks	End seal+ side seal	Normal sealing situation
DD	Double end seal+side seal	With powder, scrap wood, dust etc.
ZZ	End seal+side seal+scraper	With iron filings, impurities etc
KK	Double end seal+side seal+ scraper	With mist, scrap iron, dirty etc.

If the working condition is worse, with enough room, besides the seal of rail, the dustproof bellows can be added. (see fig-12)

Fig-12

15. Lubrication of linear guideway

Keep working condition clear and tidy to avoid scrap iron, dirty, foreign materials that stick to body of linear guideway. If there is dust in workshop, dust-proof device equipment should be assembled including the under seal of LMG.(See fig-13)

The main purpose of lubrication is to eliminate friction and abrasion to avoid super heat, which will damage the inner structure as well as influence motion function. Before ex-factory, the linear guides are injected with low-noise grease to make sure the good lubrication of balls in motion, but to avoid the deficiency caused by the wastage of lubrication, we suggest supplementing periodically when the blocks motion travel to 50km. When linear guideway is moving at a high velocity (V≥35m/min) N32 lubrication oil is recommended (refer to GGB443-84). It is equivalent to 20# machinery oil in old standard, when temperature is 40℃, oil's viscosity is 28.5~35.2cst. Linear guideway should be lubricated periodically or connected with oil hose (shown as Fig-13). Li grease is recommended when it's running at low velocity (V<35m/min)

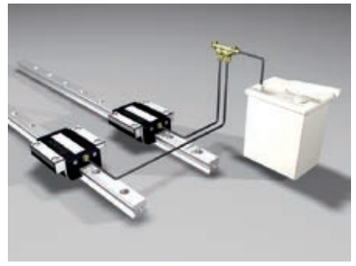


Fig-13

(In the low velocity condition, it is not allowed to use the gas to clean the internal grease before installation)

GZB series-Heavy load Roller linear guide

1. Structure and Characteristic

● Structure

GZB roller heavy loading linear motion guide is consisted of rail, block, roller, re-circulator, retainer, roller cage and seal gasket etc. (fig-1)

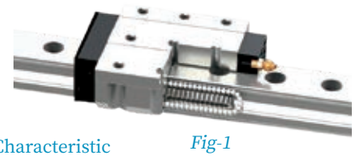


Fig-1

● Characteristic

◆ Heavy load

1、Line contact instead of traditional point contact and consequently greatly improved loading capacity with high rigidity of rollers.

2、Roller guide use V shape groove design and can bear more torque.

In different applications, the distortion and stress distribution of roller rails are shown as below

Fig-2

3、Optimize the structure of block with finite element analysis.

Fig-3

◆ High rigidity

GZB roller linear guide uses the roller to replace the ball,and the contact mode between the rollers and the raceway changes from point contact to linear contact,which greatly improves the rigidity of the rolling linear guide and enables the machine to maintain higher accuracy.

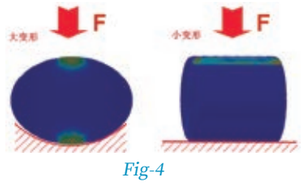


Fig-4

◆ High speed and accuracy

Roller cage prevents roller deflecting motion and moves stably. At the same time, it forms the oil film contact between roller and cage, avoid friction among rollers, reduce the heat when roller guide is running and achieve high speed and precision movement.

◆ Equal load in four directions

GZB roller heavy loading linear guide contact angle between roller and raceway is 45o, so it has equal load in four directions.

◆ High pressure seal

GZB roller heavy duty linear guide pair can choose a variety of sealing forms to improve its sealing performance, especially in the high dust, more iron chips or wood chips in the environment with dustproof steel belt sealing form, the use of better.

Dust-proof steel belt: it can replace the countersink gland, make the surface of the guide rail more flat, no foreign matter will accumulate in the process of scraping, and it is easy to use and can be reused many times.

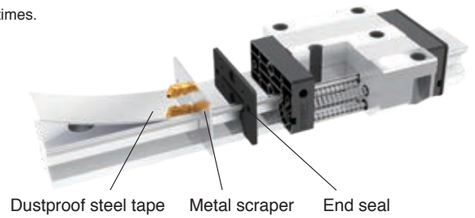


Fig-5

Metal scraper: Used in conjunction with the end seal, large iron filings can be scraped in advance to improve the sealing effect.

End seal: end seal and guide rail contour design, peripheral lip and guide rail interference fit to ensure a good sealing effect;

At the same time, the double-layer end seal can be selected to strengthen the sealing performance.

Tab-1

Amounting dimension L_4 increase(mm)				
Spec.	Without code	DD	ZZ	KK
GZB25	0	5	2	7
GZB30	0	5.4	3	8.4
GZB35	0	6	3	9
GZB45	0	7	4	11
GZB55	0	7	5	12
GZB65	0	8.4	5	13.4
GZB85	0	13	6	19
GZB100	0	/	6	/
GZB125	0	/	6	/

Note:Without DD、KK for GZB100、GZB125

3. Preload type and Application

Details see Tab-2

Tab-2

Preload type	Application
P0 (0.1-0.12C)	With strong rigidity, impact and vibration condition, normally used for main rails of heavy duty machines.
P1 (0.05-0.08C)	High repeatability positioning accuracy, suspension/ torque load and single LMG, Normally used in precision positioning mechanism and measuring devices.
P (0.02-0.04C)	Small impact

4. Code rule and Definition

Roller linear guide code

GZB 25 A A L T DD 2 P 2 X7000 (2) -4 -20/20 - □

- GZB series
- Size(25、30、35、45、55、65、85、100、125)
- Block type(A:Wide B:Narrow)
- Block fixed mode(A:Thread hole)
- Code of block length(standard is not specified, L for lengthen)
- T:Code of special requested block (standard is not specified)
- Seal type
  - No mark: end seal + side seal
  - DD: double end seal + side seal
  - ZZ: end seal + side seal + metal scraper
  - KK: double end seal + side seal + metal scraper
- Number of blocks used per rail: 1、2…
- Preload: P0、P1、P
- Number of rails used in the same surface1、2、3…
- Length of rail way
- Number of joint guide 2、3、4...
- Accuracy:1、2、3、4
- End size:a/b
- Code of our own company

Note:

If you need side refueling, please tell us.

Please use the code as below when you just need blocks or rails:

○ **Block code**

GZB 25 A A L T DD P -4 - □

- GZB series
- Size(25、30、35、45、55、65)
- Block type(A:Wide B:Narrow)
- Block fixed mode(A:Thread hole)
- Code of block length(standard is not specified, L for lengthen)
- T:Code of special requested block (standard is not specified)
- Seal type(P33 Tab-12)
- Preload: P
- Accuracy:4
- Code of our own company

○ **Rail code**

GZB 25 T X4000 -4 -20/20 - □

- GZB series
- Size(25、30、35、45、55、65)
- T:Code of special requested block (standard is not specified)
- Length of rail
- Accuracy:4
- End size:a/b
- Code of our own company

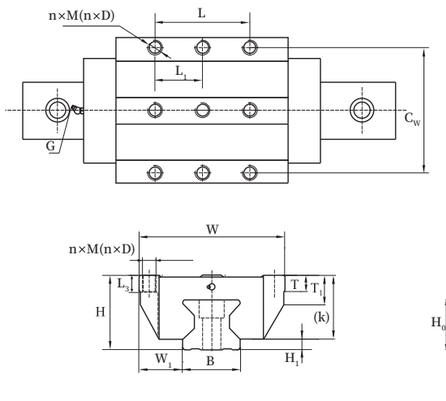
GZB AA/AALRoller heavy duty linear guide

Unit: mm

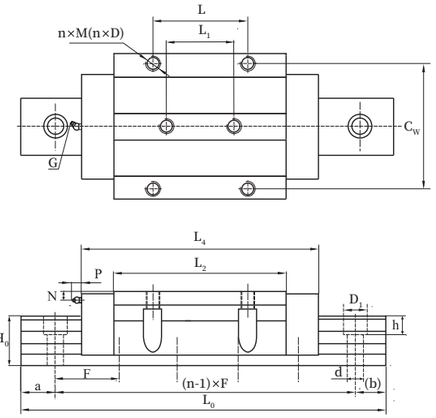
Note:

1). In the table, M_A, M_B and M_C, as shown in the figure below on the right, refer to the rated static moment value of a slider.
2). L_{MAX} in the table indicates the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).
3). For a single guide rail, if there is no special requirement, the hole distance between the two ends is equal.
4). L_4 is the total size of the unmarked seal form, and the size changes of other seal forms refer to P42 Table -1.
5). GZB series AA/AAL slide block is flange type, slide mounting hole is screw hole, lock type reference M size, lock type reference D size.
6). The GZB85, GZB100 and GZB125 sliding blocks are symmetrically distributed in 3 rows of mounting holes in the L, C and W directions on the top surface, with a total of 9 holes.

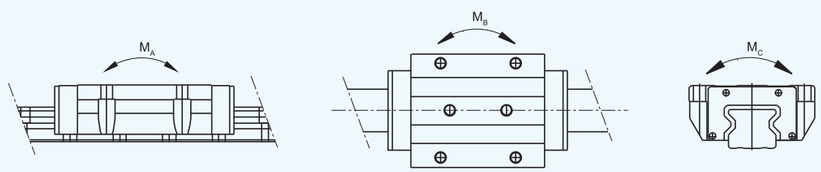
GZB85～125



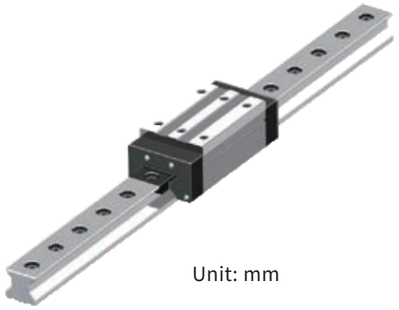
GZB25～65



spec.	Dimension of assembly		Dimension of block													Dimension of rail		Dimension of rail		Smallest end size	Dimension of oil cup			Dynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
	H	W_1	K	W	L_4	C_W	L	L_1	M	D	T	T_1	L_3	L_2	H_1	B	H_0	d×D_1×h	F	Max. single length L_{max}	a	G	P	N	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
GZB25AA GZB25AAL	36	23.5	31.5	70	98.6 115	57	45	40	8	6.8	9.5	14	10	65.2 81.6	4.5	23	24	7×11×9	30	6000	10	M6	14	5.5	27.8 34	60.8 76.6	684 1035	684 1035	830 1213	0.6 0.8	3.2	GZB25AA GZB25AAL
GZB30AA GZB30AAL	42	31	36	90	110.4 132	72	52	44	10	8.5	9.5	21	10	71 92.6	6	28	29.5	9×14×12	40	6000	13	M6	14	6.5	38.9 49	82.5 104.5	1060 1712	1060 1712	1445 1845	1.06 1.4	4.5	GZB30AA GZB30AAL
GZB35AA GZB35AAL	48	33	41.5	100	125 152.9	82	62	52	10	8.5	12	30	13	79 106.9	6.5	34	31.2	9×14×12	40	6000	13	M6	14	9	57.9 73	106 141.9	1548 2708	1548 2708	2343 3283	1.6 2.0	5.9	GZB35AA GZB35AAL
GZB45AA GZB45AAL	60	37.5	52	120	155 188.8	100	80	60	12	10.5	15	36	15	108 141.8	8	45	38	14×20×17	52.5	6000	15	M8×1	16	10	92.6 116	179 230.9	3050 5470	3050 5470	4520 6330	3.2 4.4	10	GZB45AA GZB45AAL
GZB55AA GZB55AAL	70	43.5	60	140	178.3 226.6	116	95	70	14	12.5	20	41	18	125.5 173.8	10	53	44	16×23×20	60	6000	15	M8×1	16	13	130 168	258 360	5567 10713	5567 10713	8243 11927	4.3 5.9	13.3	GZB55AA GZB55AAL
GZB65AA GZB65AAL	90	53.5	78	170	232.2 295.2	142	110	82	16	14.5	23	55	23	160.8 223.8	12	63	52.75	18×26×22	75	6000	20	M8×1	16	17	213 276	378.8 530.4	11590 22170	11590 22170	16200 22550	13.6 18.7	20.3	GZB65AA GZB65AAL
GZB85AAL	110	65	95	215	344	185	140	70	20	17.5	24	64	26	257	15	85	73	24×35×28	90	6000	25	M8×1	16	21	460	945.2	45600	45600	51420	21.6	35.2	GZB85AAL
GZB100AAL	120	75	105	250	382.4	220	200	100	20	17.5	25	76	30	290.4	15	100	80	26×39×32	105	6000	30	M10×1	16	23	547	1330	61200	61200	73140	31.5	46.8	GZB100AAL
GZB125AAL	160	97.5	135.5	320	485	270	205	102.5	24	21	30	66	45	360	24.5	125	110	33×48×45	120	6000	35	M10×1	16	23	1040	1924	123176	123176	114438	65.5	84.6	GZB125AAL



GZB BA/BALRoller heavy duty linear guide



Unit: mm

Note:

1). In the table, M_A, M_B and M_C, as shown in the figure below on the right, refer to the rated static moment value of a slider.

2). L_{MAX} in the table indicates the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).

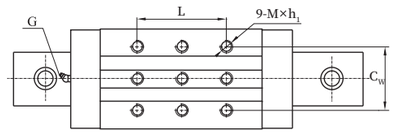
3). For a single guide rail, if there is no special requirement, the hole distance between the two ends is equal.

4). L_4 is the total size of the unmarked seal form, and the size changes of other seal forms refer to P42 Table -1.

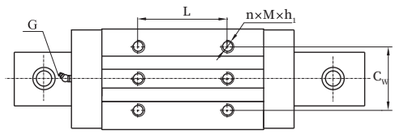
5). The GZB series BA/BAL slider is narrow and high, and the mounting hole on the top surface of the slider is a screw hole.

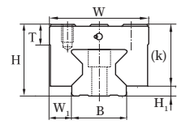
6). The GZB85, GZB100 and GZB125 sliding blocks are symmetrically distributed in 3 rows of mounting holes in the L, C and W directions on the top surface, with a total of 9 holes.

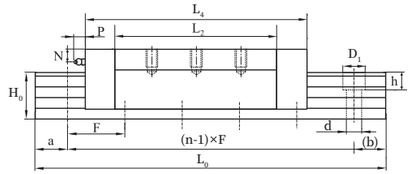
GZB85～125



GZB25～65

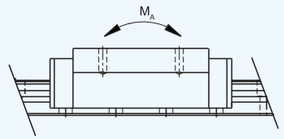


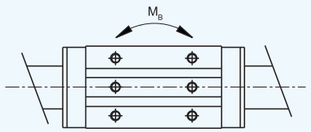


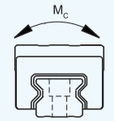


spec.	Dimension of assembly		Dimension of block									Dimension of rail		spec.
	H	W_1	K	W	L_4	C_W	L	M×h_1	T	L_2	H_1	B	H_0	
GZB25BA GZB25BAL	40	12.5	35.5	48	98.6 115	35	35 50	M6×8	9.5	65.2 81.6	4.5	23	24	GZB25BA GZB25BAL
GZB30BA GZB30BAL	45	16	39	60	110.4 132	40	40 60	M8×10	10	71 92.6	6	28	29.5	GZB30BA GZB30BAL
GZB35BA GZB35BAL	55	18	48.5	70	125 152.9	50	50 72	M8×12	12.5	79 106.9	6.5	34	31.2	GZB35BA GZB35BAL
GZB45BA GZB45BAL	70	20.5	62	86	155 188.8	60	60 80	M10×16	15	108 141.8	8	45	38	GZB45BA GZB45BAL
GZB55BA GZB55BAL	80	23.5	70	100	178.3 226.6	75	75 95	M12×18	18	125.5 173.8	10	53	44	GZB55BA GZB55BAL
GZB65BA GZB65BAL	90	31.5	78	126	232.2 295.2	76	70 120	M16×20	26	160.8 223.8	12	63	52.75	GZB65BA GZB65BAL
GZB85BAL	110	35.5	95	156	344	100	140	M18×25	30	257	15	85	73	GZB85BAL
GZB100BAL	120	50	105	200	382.4	130	200	M20×27	33	290.4	15	100	80	GZB100BAL
GZB125BAL	160	57.5	135.5	240	485	184	205	M24×30	40	360	24.5	125	110	GZB125BAL

Dimension of rail			Smallest end size	Dimension of oil cup			Dynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
d×D_1×h	F	Max. single length L_{max}	a	G	P	N	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
7×11×9	30	6000	10	M6	14	9.5	27.8 34	60.8 76.6	684 1035	684 1035	830 1213	0.5 0.7	3.2	GZB25BA GZB25BAL
9×14×12	40	6000	13	M6	14	9.5	38.9 49	82.5 104.5	1060 1712	1060 1712	1445 1845	0.8 1.1	4.5	GZB30BA GZB30BAL
9×14×12	40	6000	13	M6	14	16	57.9 73	106 141.9	1548 2708	1548 2708	2343 3283	1.4 1.7	5.9	GZB35BA GZB35BAL
14×20×17	52.5	6000	15	M8×1	16	20	92.6 116	179 230.9	3050 5470	3050 5470	4520 6330	3 4	10	GZB45BA GZB45BAL
16×23×20	60	6000	15	M8×1	16	23	130 168	258 360	5567 10713	5567 10713	8243 11927	3.8 5.1	13.3	GZB55BA GZB55BAL
18×26×22	75	6000	20	M8×1	16	17	213 276	378.8 530.4	11590 22170	11590 22170	16200 22550	10.9 14.6	20.3	GZB65BA GZB65BAL
24×35×28	90	6000	25	M8×1	16	21	460	945.2	45600	45600	51420	14.7	35.2	GZB85BAL
26×39×32	105	6000	30	M10×1	16	23	547	1330	61200	61200	73140	24.5	46.8	GZB100BAL
33×48×45	120	6000	35	M10×1	16	23	1040	1924	123176	123176	114438	46	84.6	GZB125BAL







GGB ball linear guide

GGB is the earliest developed LM guide and is one of the widely used guides. Design with equal 45o contact angle, which makes equal load in vertical upside ,vertical downside, horizontal left and horizontal right four orientations(see fig-1), and it has heavy rated load, good rigidity, high stiffness and strong torque resistance of three directions, so it also calls four direction equal load LM guide.

1. Basic structure of GGB series

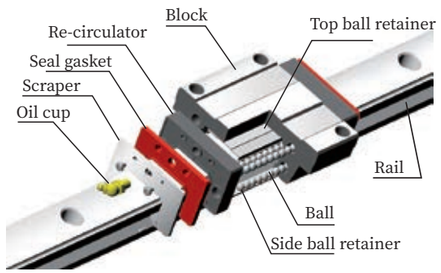


Fig-1

2. Application

Machining center, NC lathe machine, wire spark machine, portage device, wood machinery, laser machine, precision test instrument, packing machine, food machinery, medical machinery, tool grinding machine, plane grinding machine.

3. Seal type and dimension increase

Tab-1

Amounting dimension L_1 increase (mm)				
Spec.	Without code	DD	ZZ	KK
GGB15	0	4	2	6
GGB16	0	4	2	6
GGB20	0	4.8	2.4	7.2
GGB25	0	5	3	8
GGB30	0	6	3	9
GGB35	0	6	3	9
GGB45	0	8	4	12
GGB55	0	8	4	12
GGB65	0	8.6	5	13.6
GGB85	0	11	5	16

4. Preload type and Application

Tab-2

● Recommended preload under different accuracy

Accuracy	Preload type			
Grade	P_0	P_1	P	P_3
2、3、4	√	√	√	
5		√	√	√

Tab-3

● Recommended preload under different application

Preload type	Application
P0（0.08—0.1C）	With strong rigidity, impact and vibration condition, normally used for main rails of heavy duty machines.
P1（0.03—0.05C）	High repeatability positioning accuracy, suspension/ torque load and single LMG, Normally used in precision positioning mechanism and measuring devices.
P（0—0.02C）	Small impact
P3 (with clearance)	Transmission machine with low accuracy.

5. Code rule and Definition

Ball linear guide code

GGB 25 A A L T DD 2 P 2 X7000 (2) -5 -20/20 -□

- GGB Series
- Size(16、20、25、30、35、45、55、65、85)
- Block type(A:Wide B:Narrow)
- Block fixed mode(A:Thread B:Through)
- Code of block length(standard is not specified, L for lengthen)
- T:Code of special requested block (standard is not specified)
- Seal type
  - No mark: end seal + side seal
  - DD: double end seal + side seal
  - ZZ: end seal + side seal + metal scraper
  - KK: double end seal + side seal + metal scraper
- Number of blocks used per rail:1、2…
- Preload:P0、P1、P、P3
- Number of rails used in thesamesurface1、2、3…
- Rail length
- Number of joint guide 2、3、4…
- Accuracy:1、2、3、4、5
- End size:a/b
- Code of our own company

Note:

If you need side refueling, please tell us.

Please use the code as below when you just need blocks or rails:

○ Block code

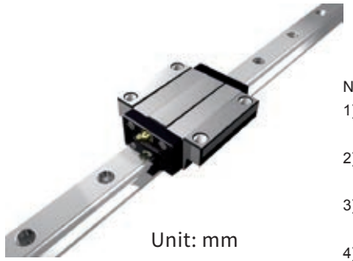
GGB 25 A A L T DD P - 5 - □

- GGB Series
- Size(16、20、25、30、35、45、55、65)
- Block type(A:Wide B:Narrow)
- Block fixed mode(A:Thread B:Through)
- Code of block length(standard is not specified, L for lengthen)
- T:Code of special requested block (standard is not specified)
- Preload:P
- Accuracy:4、5
- End size:a/b
- Code of our own company

GGB 25 T X4000 -5 -20/20 - □

- GGB Series
- Size(16、20、25、30、35、45、55、65)
- T:Code of special requested block (standard is not specified)
- Rail length
- Accuracy:4、5
- End size:a/b
- Code of our own company

GGB AA/AAL Precision ball linear guide



Unit: mm

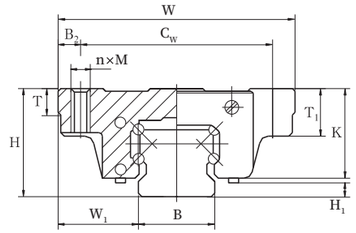
Note:

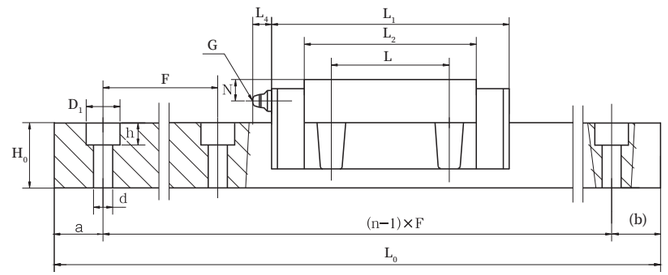
1). M_A.M_B.M_C in the table, as shown in the figure below on the right, refers to the rated static moment value of a slider.

2). L_{max} in the table is the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).

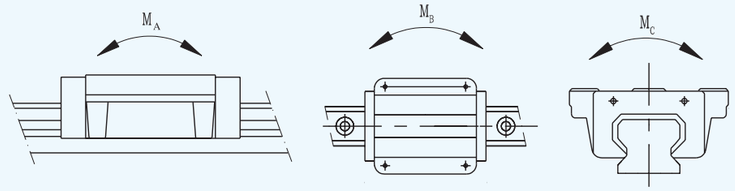
3). If there is no special requirement for a single guide rail, the distance between the hole end and the two ends should be evenly divided.

4). L1 is the total size of the unmarked seal form, and the size changes of the other seal forms refer to Table -1 of P50.

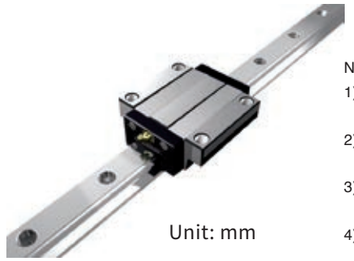




spec.	Dimension of assembly		Dimension of block											Dimension of rail		Dimension of rail			Smallest end size	Dimension of oil cup			ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
	H	W_1	K	W	L_1	C_W	L	M	T	T_1	B_2	L_2	H_1	B	H_0	d×D_1×h	F	Max. single length L_{max}	a	L_4	G	N	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
GGB15AA	24	16	19.6	47	61.8	38	30	M5	6	9	4.5	39.8	4.3	15	15	4.5×7.5×5.3	60	4000	10	7	M4	4	11.38	16.97	100	100	120	0.17	1.45	GGB15AA
GGB16AA	24	15.5	19.4	47	56.5	38	30	M5	7	11	4.5	40.5	4.5	16	15	4.5×7.5×5.3	60	4000	10	7	M4	4	8.5	13.4	70	70	100	0.17	1.62	GGB16AA
GGB20AA GGB20AAL	30	21.5	25.4	63	75.3 90	53	40	M6	8	10	5	50.5 65.2	4.6	20	17.5	6×9.5×8.5	60	4000	10	14	M6	6	17.7 21.2	25.3 33.7	200 350	200 350	270 350	0.4 0.52	2.21	GGB20AA GGB20AAL
GGB25AA GGB25AAL	36	23.5	30.5	70	83.8 103	57	45	M8	9	14	6.5	59.8 79	5.5	23	22	7×11×9	60	6000	10	14	M6	6	26.5 32.7	36.4 48.6	330 570	330 570	420 560	0.59 0.80	3.21	GGB25AA GGB25AAL
GGB30AA GGB30AAL	42	31	35	90	98 120	72	52	M10	10	18	9	71 93	7	28	26	9×14×12	80	6000	15	14	M6	7	34.9 42.7	49.6 66.1	430 720	430 720	650 870	1 1.3	4.7	GGB30AA GGB30AAL
GGB35AA GGB35AAL	48	33	40	100	110.6 136	82	62	M10	10	18	9	81.6 107	8	34	29	9×14×12	80	6000	15	14	M6	9	49.5 60.2	64.8 86.4	810 1400	810 1400	1160 1540	1.56 2.06	6.3	GGB35AA GGB35AAL
GGB45AA GGB45AAL	60	37.5	50.5	120	136 164.8	100	80	M12	15	22	10	100 128.8	9.5	45	38	14×20×17	105	6000	15	16	M8×1	12	74.8 91.4	101.2 134.9	1290 2080	1290 2080	2100 2790	2.4 3.1	11.2	GGB45AA GGB45AAL
GGB55AA GGB55AAL	70	43.5	57	140	166 206	116	95	M14	21	29	12	118 158	13	53	44	16×23×20	120	6000	15	16	M8×1	12	115.3 143.1	147.2 200.8	2180 3650	2180 3650	3640 4860	4.3 5.8	15	GGB55AA GGB55AAL
GGB65AA GGB65AAL	90	53.5	75	170	197 258.6	142	110	M16	25	37	14	147 208.6	15	63	53	18×26×22	150	6000	20	16	M8×1	12	191.8 249.1	237.5 345.4	4170 7300	4170 7300	6800 9100	7.3 10.7	22.2	GGB65AA GGB65AAL
GGB85AA GGB85AAL	110	65	94	215	244 299	185	140	M20	30	55	15	181 236	16	85	65	24×35×28	180	6000	20	16	M8×1	14	247.9 351.5	371.1 472.3	10400 12800	10400 12800	12900 17200	16.5 22.2	35.5	GGB85AA GGB85AAL



GGB$^{AB}_{ABL}$ Precision ball linear guide



Unit: mm

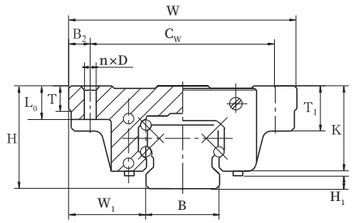
Note:

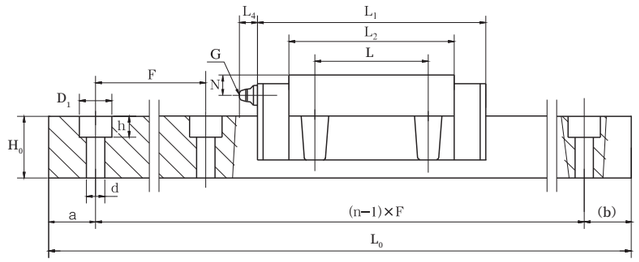
1). M_A.M_B.M_C in the table, as shown in the figure below on the right, refers to the rated static moment value of a slider.

2). L_{max} in the table is the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).

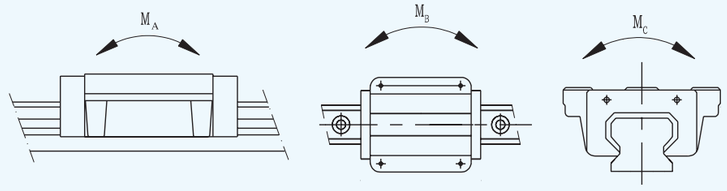
3). If there is no special requirement for a single guide rail, the distance between the hole end and the two ends should be evenly divided.

4). L1 is the total size of the unmarked seal form, and the size changes of the other seal forms refer to Table -1 of P50.





spec.	Dimension of assembly		Dimension of block												Dimension of rail		Dimension of rail			Smallest end size	Dimension of oil cup			ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
	H	W_1	K	W	L_1	C_W	L	D	T	T_1	B_2	L_0	L_2	H_1	B	H_0	d×D_1×h	F	Max. single length L_{max}	a	L_4	G	N	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
GGB15AB	24	16	19.6	47	61.8	38	30	4.5	6	9	4.5	6.95	39.8	4.3	15	15	4.5×7.5×5.3	60	4000	10	7	M4	4	11.38	16.97	100	100	120	0.17	1.45	GGB15AB
GGB16AB	24	15.5	19.4	47	56.5	38	30	4.5	7	11	4.5	7	40.5	4.5	16	15	4.5×7.5×5.3	60	4000	10	7	M4	4	8.5	13.4	70	70	100	0.17	1.62	GGB16AB
GGB20AB GGB20ABL	30	21.5	25.4	63	75.3 90	53	40	6	8	10	5	10	50.5 65.2	4.6	20	17.5	6×9.5×8.5	60	4000	10	14	M6	6	17.7 21.2	25.3 33.7	200 350	200 350	270 350	0.4 0.52	2.21	GGB20AB GGB20ABL
GGB25AB GGB25ABL	36	23.5	30.5	70	83.8 103	57	45	7	9	14	6.5	10	59.8 79	5.5	23	22	7×11×9	60	6000	10	14	M6	6	26.5 32.7	36.4 48.6	330 570	330 570	420 560	0.59 0.80	3.21	GGB25AB GGB25ABL
GGB30AB GGB30ABL	42	31	35	90	98 120	72	52	9	10	18	9	10	71 93	7	28	26	9×14×12	80	6000	15	14	M6	7	34.9 42.7	49.6 66.1	430 720	430 720	650 870	1 1.3	4.7	GGB30AB GGB30ABL
GGB35AB GGB35ABL	48	33	40	100	110.6 136	82	62	9	10	18	9	13	81.6 107	8	34	29	9×14×12	80	6000	15	14	M6	9	49.5 60.2	64.8 86.4	810 1400	810 1400	1160 1540	1.56 2.06	6.3	GGB35AB GGB35ABL
GGB45AB GGB45ABL	60	37.5	50.5	120	136 164.8	100	80	11	15	22	10	15	100 128.8	9.5	45	38	14×20×17	105	6000	15	16	M8×1	12	74.8 91.4	101.2 134.9	1290 2080	1290 2080	2100 2790	2.4 3.1	11.2	GGB45AB GGB45ABL
GGB55AB GGB55ABL	70	43.5	57	140	166 206	116	95	14	21	29	12	17	118 158	13	53	44	16×23×20	120	6000	15	16	M8×1	12	115.3 143.1	147.2 200.8	2180 3650	2180 3650	3640 4860	4.3 5.8	15	GGB55AB GGB55ABL
GGB65AB GGB65ABL	90	53.5	75	170	197 258.6	142	110	16	25	37	14	23	147 208.6	15	63	53	18×26×22	150	6000	20	16	M8×1	12	191.8 249.1	237.5 345.4	4170 7300	4170 7300	6800 9100	7.3 10.7	22.2	GGB65AB GGB65ABL
GGB85AB GGB85ABL	110	65	94	215	244 299	185	140	18	30	55	15	30	181 236	16	85	65	24×35×28	180	6000	20	16	M8×1	14	247.9 351.5	371.1 472.3	10400 12800	10400 12800	12900 17200	16.5 22.2	35.5	GGB85AB GGB85ABL



GGB BA BAL Precision ball linear guide

Unit: mm

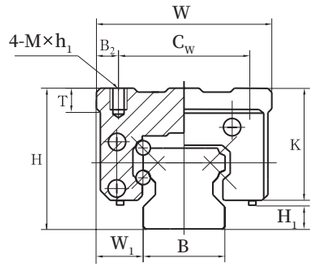
Note:

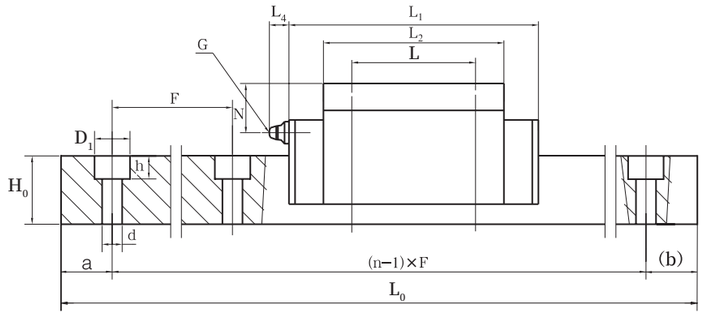
1). M_A.M_B.M_C in the table, as shown in the figure below on the right, refers to the rated static moment value of a slider.

2). L_{max} in the table is the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).

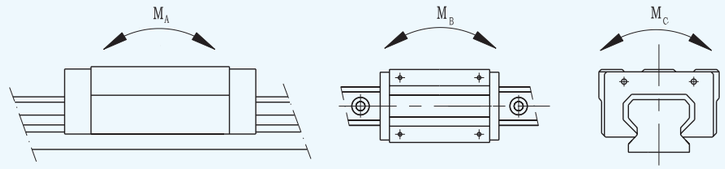
3). If there is no special requirement for a single guide rail, the distance between the hole end and the two ends should be evenly divided.

4). L1 is the total size of the unmarked seal form, and the size changes of the other seal forms refer to Table -1 of P50.





spec.	Dimension of assembly		Dimension of block										Dimension of rail		Dimension of rail			Smallest end size	Dimension of oil cup			ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
	H	W_1	K	W	L_1	C_W	L	M×h_1	T	B_2	L_2	H_1	B	H_0	d×D_1×h	F	Max. single length L_{max}	a	L_4	G	N	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
GGB15BA	28	9.5	23.6	34	61.8	26	26	M4×5	6	4	39.8	4.3	15	15	4.5×7.5×5.3	60	4000	10	7	M4	4	11.38	16.97	100	100	120	0.18	1.45	GGB15BA
GGB16BA	28	9	23.4	34	56.5	26	26	M4×5	23.4	4	40.5	4.5	16	15	4.5×7.5×5.3	60	4000	10	7	M4	9	8.5	13.4	70	70	100	0.17	1.62	GGB16BA
GGB20BA GGB20BAL	30	12	25.4	44	75.3 90	32	36 50	M5×6	9	6	50.5 65.2	4.6	20	17.5	6×9.5×8.5	60	4000	10	14	M6	6	17.7 21.2	25.3 33.7	200 350	200 350	270 350	0.30 0.39	2.21	GGB20BA GGB20BAL
GGB25BA GGB25BAL	40	12.5	34.5	48	83.8 103	35	35 50	M6×8	9	6.5	59.8 79	5.5	23	22	7×11×9	60	6000	10	14	M6	9	26.5 32.7	36.4 48.6	330 570	330 570	420 560	0.51 0.69	3.21	GGB25BA GGB25BAL
GGB30BA GGB30BAL	45	16	38	60	98 120	40	40 60	M8×10	9	10	71 93	7	28	26	9×14×12	80	6000	15	14	M6	10	34.9 42.7	49.6 66.1	430 720	430 720	650 870	0.79 1	4.7	GGB30BA GGB30BAL
GGB35BA GGB35BAL	55	18	47	70	110.6 136	50	50 72	M8×12	11	10	81.6 107	8	34	29	9×14×12	80	6000	15	14	M6	16	49.5 60.2	64.8 86.4	810 1400	810 1400	1160 1540	1.1 1.4	6.3	GGB35BA GGB35BAL
GGB45BA GGB45BAL	70	20.5	60.5	86	136 164.8	60	60 80	M10×16	17	13	100 128.8	9.5	45	38	14×20×17	105	6000	15	16	M8×1	21	74.8 91.4	101.2 134.9	1290 2080	1290 2080	2100 2790	2.5 3.3	11.2	GGB45BA GGB45BAL
GGB55BA GGB55BAL	80	23.5	67	100	166 206	75	75 95	M12×18	18	12.5	118 158	13	53	44	16×23×20	120	6000	15	16	M8×1	22	115.3 143.1	147.2 200.8	2180 3650	2180 3650	3640 4860	4.4 5.9	15	GGB55BA GGB55BAL
GGB65BA GGB65BAL	90	31.5	75	126	197 258.6	76	70 120	M16×19	24.5	25	147 208.6	15	63	53	18×26×22	150	6000	20	16	M8×1	12	191.8 249.1	237.5 345.4	4170 7300	4170 7300	6800 9100	5.8 8.4	22.2	GGB65BA GGB65BAL
GGB85BA GGB85BAL	110	35.5	94	156	244 299	100	80 140	M18×23	30	28	181 236	16	85	65	24×35×28	180	6000	20	16	M8×1	14	247.9 351.5	371.1 472.3	10400 12800	10400 12800	12900 17200	13 17	35.5	GGB85BA GGB85BAL



GLB Low assembly precision ball linear guide

The GLB series uses four columns of steel balls to bear the load design, so that it has the characteristics of high rigidity and high load, and has the load cutting characteristics such as direction and automatic aligning function, which can absorb the assembly error of the mounting surface, achieve high precision, and reduce the combination height and shorten the length of the slide block, It is very suitable for high-speed dynamic industrial machinery and small equipment with space requirements.

1. Basic structure

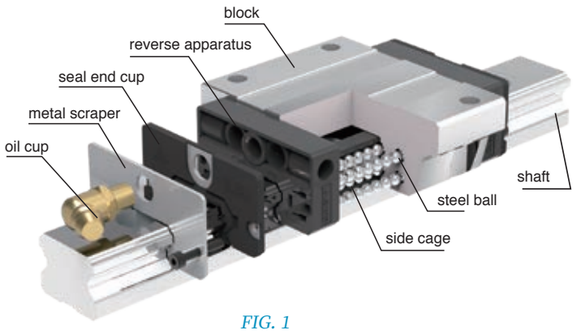


FIG. 1

2. Application

Handling equipment, automation equipment, precision testing instruments, food machinery, packaging machinery, medical equipment, semiconductor/liquid crystal manufacturing equipment

3. Sealing type and increased dimensions

Tab-1

Mounting dimension L1 increase (mm) (L1 refer to size in the catalogue)				
Type	No marks	DD	ZZ	KK
GLB15	0	4	2	6
GLB20	0	4	2.4	6.4
GLB25	0	4	3	7
GLB30	0	4	3	7
GLB35	0	4	3	7

4. Type and occasion of preloading

Tab-2

● Preloading is recommended according to different accuracy

Accurcy	Preload type			
Grade	P0	P1	P	P3
2、3、4	√		√	√
5		√	√	√

Tab-3

● Preloading is recommended according to different occasion

Preload type	Application
P0（0.08—0.1C）	It is often used in situations with high rigidity requirements, vibration and shock
P1（0.03—0.05C）	It is often used for light vibration, light impact, bearing cantilever load and torsional load
P（0—0.02C）	It is often used in low-impact situations
P3（Gapped）	It is often used in occasions where the accuracy requirements are not high, the installation base surface accuracy is low, and the sliding resistance requirements are small

5. Numbering rules and meaning

Product code

GLB 25 A A S T DD 2 P 2 X7000 (2) -5 -20/20 - □

- GLB series
- Size (15、20、25、30、35)
- Block type (A: wide B: narrow)
- Block fixing method (A: screw hole B: through hole)
- Block length type (S: Short type without mark: standard type)
- T: Special requirements No mark: no special requirements
- Seal form
  - No mark: end seal + side seal
  - DD: double end seal + side seal
  - ZZ: end seal + side seal + metal scraper
  - KK: double end seal + side seal + metal scraper
- Number of blocks used per shaft: 1, 2....
- Preload: P0, P1, P, P3
- Number of shafts used in the same surface1、2、3....
- Shaft length
- Number of long segments of single shaft2、3、4....
- End distance: a/b
- Accuracy：1、2、3、4、5
- Internal improvement sequence number, no mark means no internal improvement sequence number

Note:
1. If side refueling is required, please specify;
2. Shaft unit: root; Block unit: pc; Unit of linear guide: set (one shaft and all parts on the shaft are as a set)

Order shaft and block separately, please order according to the following code:

○Block product code

GLB 25 A A S T DD P -5 - □

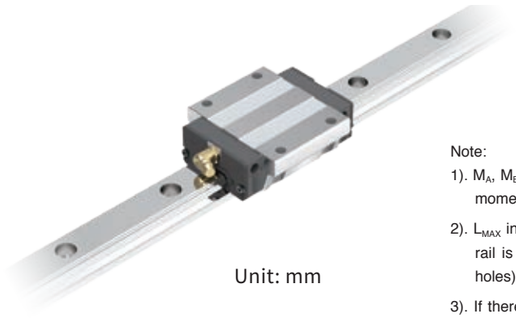
- GLB series
- Size (15、20、25、30、35)
- Block type (A: wide B: narrow)
- Block fixing method (A: screw hole B: through hole)
- Block length type (S: Short type without mark: standard type))
- T: Block requirements No mark: no Block requirements
- Seal form(refer to above introduction)
- Preload:P1、P
- Accuracy：4、5
- Internal improvement sequence number, no mark means no internal improvement sequence number

○Shaft product code

GLB 25 T X4000 -5 -20/20 - □

- GLB series
- Size (15、20、25、30、35)
- T: Special requirements No mark: no special requirements
- Shaft length
- Accuracy：4、5
- End distance: a/b
- Internal improvement sequence number, no mark means no internal improvement sequence number

GLB AAS / AA Precision low assembly ball linear guide pair



Unit: mm

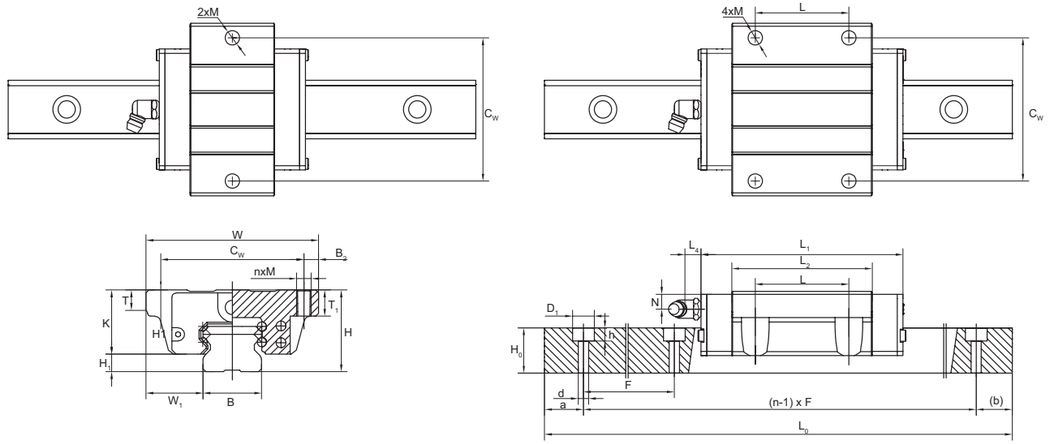
Note:

1). M_A, M_B and M_C in the table, as shown in the figure below on the right, refer to the rated static moment value of a slider.

2). L_{MAX} in the table is the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).

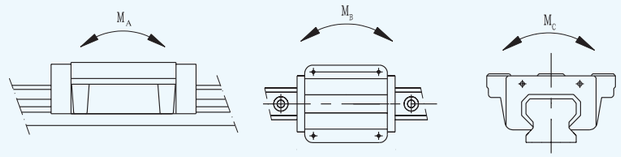
3). If there is no special requirement for a single guide rail, the distance between the hole end and the two ends should be evenly divided.

4).L_1 size is the standard sealing form size, check the sealing form in detail.

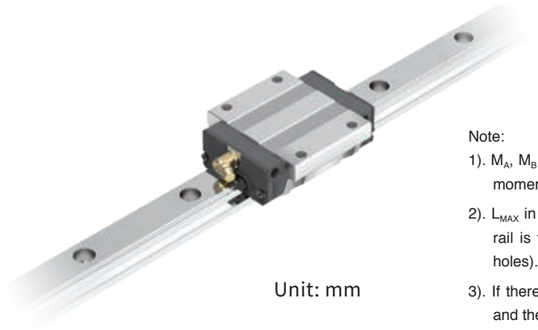


spec.	Dimension of assembly		Dimension of block											Dimension of rail		spec.
	H	W_1	K	W	L_1	C_W	L	M	T	T_1	B_2	L_2	H_1	B	H_0	
GLB15AAS	24	18.5	19.7	52	40.1	41	-	M5	5	7.2	5.5	23.1	4.3	15	12.5	GLB15AAS
GLB15AA					56.8		26					39.8				GLB15AA
GLB20AAS	28	19.5	22.3	59	51	49	-	M6	7	9	5	29	5.7	20	15.5	GLB20AAS
GLB20AA					70.1		32					48.1				GLB20AA
GLB25AAS	33	25	26.8	73	59.5	60	-	M8	7.5	11	6.5	35.5	6.2	23	18	GLB25AAS
GLB25AA					83		35					59				GLB25AA
GLB30AAS	42	31	32	90	69.5	72	-	M10	7.5	11	9	41.5	10	28	23	GLB30AAS
GLB30AA					98.1		40					70.1				GLB30AA
GLB35AAS	48	33	37	100	75	82	-	M10	10	14	9	45	11	34	27.5	GLB35AAS
GLB35AA					108		50					78				GLB35AA

spec.	Dimension of rail			Smallest end size	Dimension of oil cup			ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
	dxD_1xh	F	Max. single length L_{max}	a	L_4	G	N	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
GLB15AAS	4.5x7.5x5.3	60	4000	20	7	M4	5.5	5.35	9.4	40	40	80	0.12	1.25	GLB15AAS
GLB15AA								7.83	16.19	100	100	130	0.21		GLB15AA
GLB20AAS	6x9.5x8.5	60	4000	20	14	M6	6	7.23	12.74	60	60	130	0.19	2.08	GLB20AAS
GLB20AA								10.31	21.13	160	160	220	0.32		GLB20AA
GLB25AAS	7x11x9	60	4000	20	14	M6	8	11.4	19.5	120	120	230	0.35	2.67	GLB25AAS
GLB25AA								16.27	32.4	320	320	380	0.59		GLB25AA
GLB30AAS	7x11x9	80	4000	20	14	M6	8	16.42	28.1	210	210	400	0.62	4.35	GLB30AAS
GLB30AA								23.7	47.46	550	550	680	1.04		GLB30AA
GLB35AAS	9x14x12	80	4000	20	14	M6	8.5	22.66	37.38	310	310	560	0.84	6.14	GLB35AAS
GLB35AA								33.35	64.84	690	690	980	1.45		GLB35AA



GLB ABS AB Precision low assembly ball linear guide pair



Unit: mm

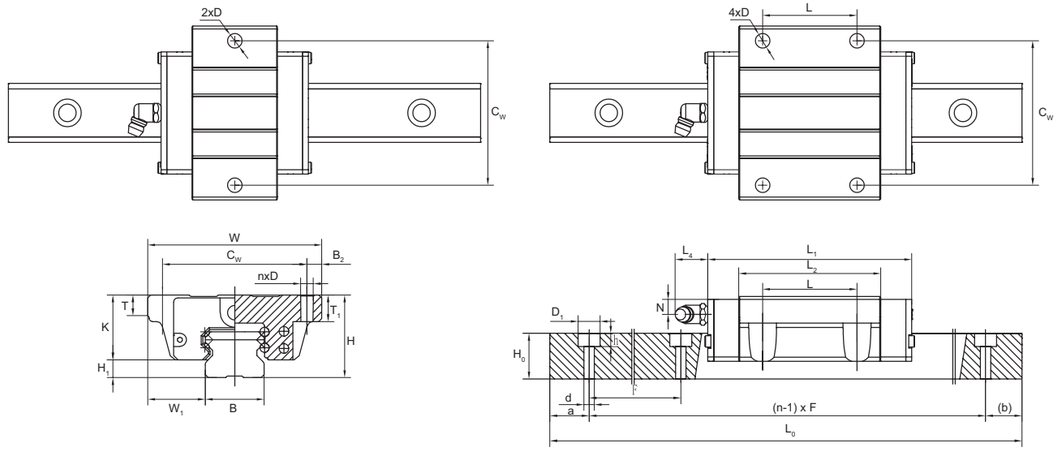
Note:

1). M_A, M_B and M_C in the table, as shown in the figure below on the right, refer to the rated static moment value of a slider.

2). L_{MAX} in the table is the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).

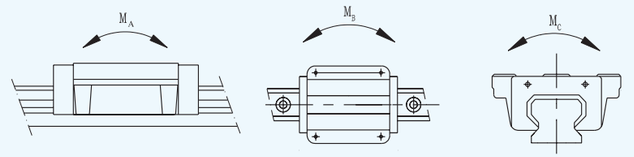
3). If there is no special requirement for a single guide rail, the distance between the hole end and the two ends should be evenly divided.

4).L_1 size is the standard sealing form size, check the sealing form in detail.

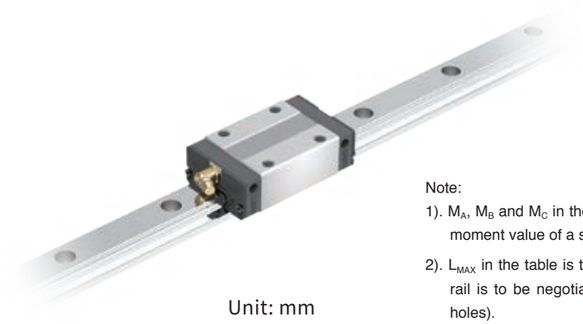


spec.	Dimension of assembly		Dimension of block											Dimension of rail		spec.
	H	W_1	K	W	L_1	C_W	L	D	T	T_1	B_2	L_2	H_1	B	H_0	
GLB15ABS	24	18.5	19.7	52	40.1	41	-	∅4.5	5	7.2	5.5	23.1	4.3	15	12.5	GLB15ABS
GLB15AB					56.8		26					39.8				GLB15AB
GLB20ABS	28	19.5	22.3	59	51	49	-	∅5.5	7	9	5	29	5.7	20	15.5	GLB20ABS
GLB20AB					70.1		32					48.1				GLB20AB
GLB25ABS	33	25	26.8	73	59.5	60	-	∅7	7.5	11	6.5	35.5	6.2	23	18	GLB25ABS
GLB25AB					83		35					59				GLB25AB
GLB30ABS	42	31	32	90	69.5	72	-	∅9	7.5	11	9	41.5	10	28	23	GLB30ABS
GLB30AB					98.1		40					70.1				GLB30AB
GLB35ABS	48	33	37	100	75	82	-	∅9	10	14	9	45	11	34	27.5	GLB35ABS
GLB35AB					108		50					78				GLB35AB

Dimension of rail			Smallest end size	Dimension of oil cup			ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
dxD$_1$xh	F	Max. single length L_{max}	a	L_4	G	N	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
4.5x7.5x5.3	60	4000	20	7	M4	5.5	5.35	9.4	40	40	80	0.12	1.25	GLB15ABS
							7.83	16.19	100	100	130	0.21		GLB15AB
6x9.5x8.5	60	4000	20	14	M6	6	7.23	12.74	60	60	130	0.19	2.08	GLB20ABS
							10.31	21.13	160	160	220	0.32		GLB20AB
7x11x9	60	4000	20	14	M6	8	11.4	19.5	120	120	230	0.35	2.67	GLB25ABS
							16.27	32.4	320	320	380	0.59		GLB25AB
7x11x9	80	4000	20	14	M6	8	16.42	28.1	210	210	400	0.62	4.35	GLB30ABS
							23.7	47.46	550	550	680	1.04		GLB30AB
9x14x12	80	4000	20	14	M6	8.5	22.66	37.38	310	310	560	0.84	6.14	GLB35ABS
							33.35	64.84	690	690	980	1.45		GLB35AB



GLB BAS BA Precision low assembly ball linear guide pair



Unit: mm

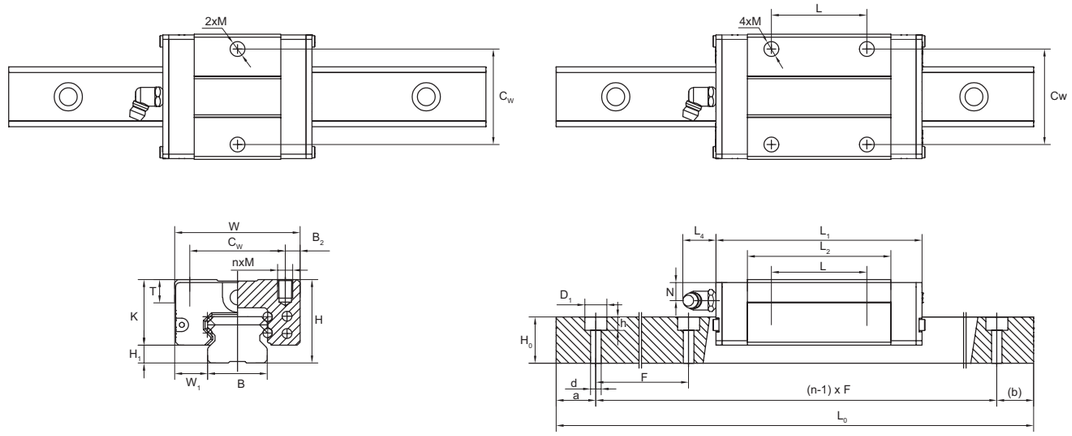
Note:

1). M_A, M_B and M_C in the table, as shown in the figure below on the right, refer to the rated static moment value of a slider.

2). L_{MAX} in the table is the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).

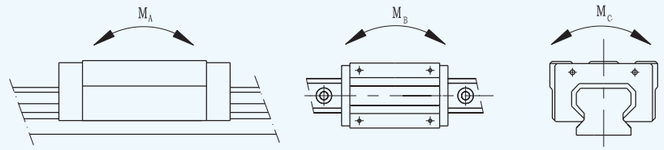
3). If there is no special requirement for a single guide rail, the distance between the hole end and the two ends should be evenly divided.

4).L_1 size is the standard sealing form size, check the sealing form in detail.



spec.	Dimension of assembly		Dimension of block										Dimension of rail		spec.
	H	W_1	K	W	L_1	C_W	L	MXh_1	T	B_2	L_2	H_1	B	H_0	
GLB15BAS	24	9.5	19.7	34	40.1	26	-	M4X6	6	4	23.1	4.3	15	12.5	GLB15BAS
GLB15BA					56.8		26				39.8				GLB15BA
GLB20BAS	28	11	22.3	42	51	32	-	M5X7	8	5	29	5.7	20	15.5	GLB20BAS
GLB20BA					70.1		32				48.1				GLB20BA
GLB25BAS	33	12.5	26.8	48	59.5	35	-	M6X9	8	6.5	35.5	6.2	23	18	GLB25BAS
GLB25BA					83		35				59				GLB25BA
GLB30BAS	42	16	32	60	69.5	40	-	M8X12	10	10	41.5	10	28	23	GLB30BAS
GLB30BA					98.1		40				70.1				GLB30BA
GLB35BAS	48	18	37	70	75	50	-	M8X12	12	10	45	11	34	27.5	GLB35BAS
GLB35BA					108		50				78				GLB35BA

spec.	Dimension of rail			Smallest end siz	Dimension of oil cup			ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
	dxD$_1$xh	F	Max. single length L_{max}	a	L_4	G	N	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
GLB15BAS	4.5x7.5x5.3	60	4000	20	7	M4	5.5	5.35	9.4	40	40	80	0.09	1.25	GLB15BAS
GLB15BA								7.83	16.19	100	100	130	0.15		GLB15BA
GLB20BAS	6x9.5x8.5	60	4000	20	14	M6	6	7.23	12.74	60	60	130	0.15	2.08	GLB20BAS
GLB20BA								10.31	21.13	160	160	220	0.24		GLB20BA
GLB25BAS	7x11x9	60	4000	20	14	M6	8	11.4	19.5	120	120	230	0.25	2.67	GLB25BAS
GLB25BA								16.27	32.4	320	320	380	0.41		GLB25BA
GLB30BAS	7x11x9	80	4000	20	14	M6	8	16.42	28.1	210	210	400	0.45	4.35	GLB30BAS
GLB30BA								23.7	47.46	550	550	680	0.76		GLB30BA
GLB35BAS	9x14x12	80	4000	20	14	M6	8.5	22.66	37.38	310	310	560	0.66	6.14	GLB35BAS
GLB35BA								33.35	64.84	690	690	980	1.13		GLB35BA



GGD radial heavy duty rolling linear guide pair

1. Structure and characteristics

● Structure

GGD series radial heavy duty rolling linear guide rail with retainer chain is composed of guide rail, slide block, ball, reversing device, reversing assembly, top seal, side seal, ball retainer chain, sealing end cap, oil cup or tubing joint, etc. (FIG-1).

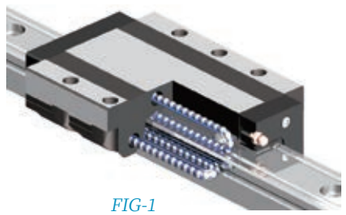


FIG-1

● Features

◆ Radial heavy load, high rigidity, small volume

1. As shown in FIG. 2, the radial force Angle of GGD guideway pair is vertical downward, which greatly improves the radial load capacity.

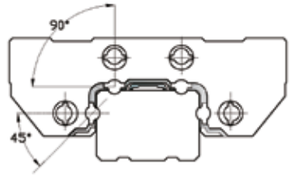


FIG-2

2. Improve the fitness f of the raceway and the ball, thereby improving the load capacity and rigidity of each raceway (FIG-3).

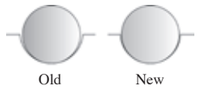


FIG-3

3. GGD guide rail pair reduces the total height size, and uses finite element analysis to optimize the structure, reducing the mutual stress points of the four raceways to the best, which not only enhances the torsional resistance of the guide rail and the deformation resistance of the slide block, but also facilitates the user to save design space. Figure -4 shows the deformation and stress distribution diagram of the GGD guide rail under rotation torque and the deformation and stress distribution diagram of the raceway on both sides of the GGD slide block under stress.

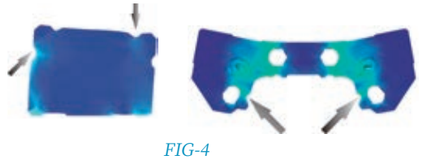


FIG-4

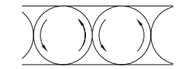
4. Table -1 shows the relationship between rated radial load, rated inverse radial load, and rated lateral load.

Tab-1

Direction	Basic dynamic load rating	Basic static load rating
Radial direction	C	C_o
Inverse radial direction	C_R=0.64C	C_{OR}=0.68C_o
crosswise	C_H=0.46C	C_{OH}=0.36C_o

◆ Low noise

The balls are separated by the ball holding chain to avoid the collision of the balls, eliminate the noise caused by the collision between the balls in the guide rail pair, and the rolling is more smooth and smooth. FIG-5 shows the comparison of ball bearing contacts. FIG-6 shows the comparison of noise data.



Do not maintain contact between chain balls

Contact between balls of GGD product

FIG-5

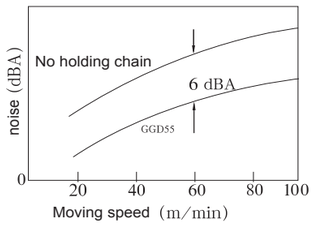


FIG-6

◆ High speed High precision

The ball holding chain avoids the friction between the balls, greatly reducing the amount of rolling friction change, and the oil film contact is formed between the ball and the holding chain, so that the heat of the guide rail is greatly reduced during operation, so as to realize the high-speed and high-precision movement of the guide rail.

◆ Long period of maintenance free

A certain amount of grease is stored in the ball holding chain, as shown in Figure 7-7, which can realize long-term maintenance free and extend the service life.

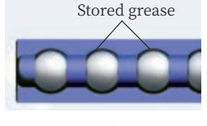
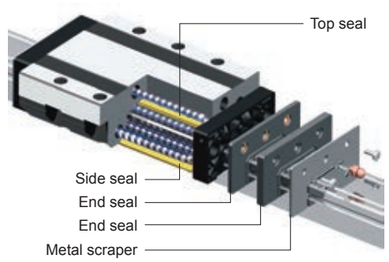


FIG-7

2. Seal form and increased size



Tab-2

Model	Mounting size increase (mm) (refer to sample size drawing)	
	No mark	ZZ
GGD35	0	3
GGD45	0	4
GGD55	0	4
GGD65	0	4

Note: Unmarked seal is conventional seal form

3. GGD radial heavy duty rolling linear guide pair preload type and application (as shown in Table -3)

Tab-3

Preload type	Application
P0 (0.08-0.1C)	Large stiffness and shock and vibration occasions, often used in heavy machine tools such as the main rail
P1 (0.03-0.05C)	It requires high repetitive positioning accuracy, side suspension load, torsion load and single root use, and is often used in
P (0-0.2C)	precision positioning mechanism and measuring mechanism ere is small vibration and impact, and when the two guides are used, the movement is required to be light
P3 (Gapped)	For conveying mechanism

4. Numbering rules and meaning

GGD 65 A A L T ZZ 2 P 2×7000 (2) −4 −□

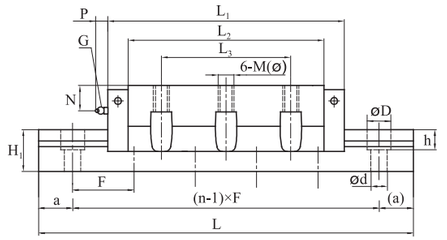
- □: Internal improvement sequence number, no mark means no internal improvement sequence number
- −4: Accuracy: 4、5、6
- (2): Number of long segments of single shaft2、3、4.... (Do not add length or mark)
- 7000: Shaft length (The maximum length of a single guide is shown in the dimensions table)
- 2: Number of shafts used in the same surface1, 2, 3....
- P: Preload type code, P0, P1, P, P3
- 2: Number of blocks used per shaft: 1, 2, 3....
- ZZ: Seal form (No mark, ZZ, None of them is marked as a regular form, and the detailed meaning of each code can be referred to Table 16 on page 36 of the samplel
- T: Guide pairs with special requirements
- L: Slider length form code (standard form slider is not marked, L is extended)
- A: Slide mounting method (A is screw hole, lock or lock type)
- A: Block type (A: wide B: narrow)
- 65: Nominal dimensions of guide rail (35, 45, 55, 65)
- GGD: Radial heavy duty rolling linear guide

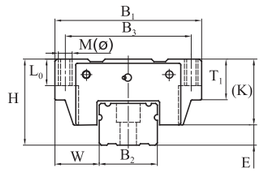
Note:
1.If baffles need to be added at both ends of the guide rail, add DB to the guide rail number
2. If side refueling is required, please specify;
3. Shaft unit: root; Block unit: pc; Unit of linear guide: set (one shaft and all parts on the shaft are as a set)

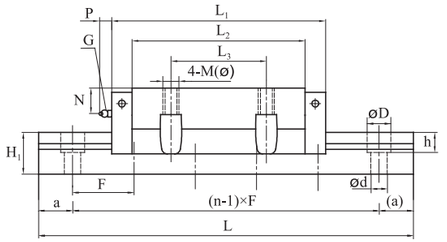
GGD AA/AAL radial heavy duty rolling linear guide pair

Unit: mm

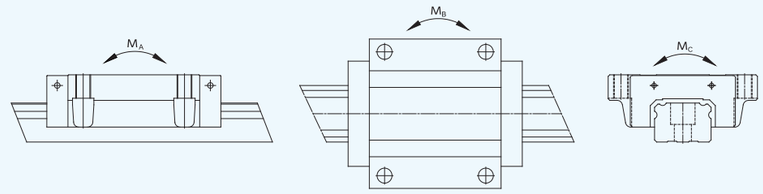
Note:
1). L_1 size is standard in seal form MN, please see seal form for details.
2). GGD series AA/AAL sliders are flanged, and the mounting holes on the top surface of the sliders are screw holes. The locking type refers to M size and the locking type refers to ø size.
3). The side view of standard slider AA and extended slider AAL is shown on the right.







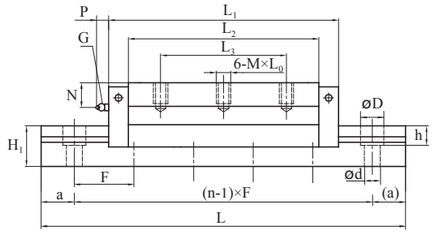
spec.	Dimension of assembly		Dimension of block											Dimension of rail		Dimension of rail			Smallest end size	Dimension of oil cup			ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
	H	W	K	B_1	L_1	B_3	L_3	M	ø	T_1	L_0	L_2	E	B_2	H_1	d×D×h	F	Max. single length L_{max}	a	G	P	N	C(KN)	C_0(KN)	M_A(N.m)	M_B(N.m)	M_C(N.m)	kg	kg/m	
GGD35AA GGD35AAL	44	33	35	100	116.4 138.4	82	62	M10	8.5	20	14	86 108	9	34	24.2	9×14×12	80	6000	15	M6	14	8	76 91	121 167	1338 2258	855 1416	1807 2366	1.4 1.8	6	GGD35AA GGD35AAL
GGD45AA GGD45AAL	52	37.5	43.1	120	143 174	100	80	M12	10.5	22	20	106 137	8.9	45	29	14×20×17	105	6000	15	M8×1	16	10	112 133	183 235	2767 4566	1725 2844	3569 4777	2.5 3.2	9.3	GGD45AA GGD45AAL
GGD55AA GGD55AAL	63	43.5	49	140	166 203	116	95	M14	12.5	24	22	124 161	14	53	36.5	16×23×20	120	6000	15	M8×1	16	11	143 174	244 321	4255 7142	2642 4435	5684 7420	4 4.8	14	GGD55AA GGD55AAL
GGD65AAL	75	53.5	60	170	257.2	142	110	M16	14.5	28	25	207	15	63	43	18×26×22	150	6000	20	M8×1	16	16	279	481	13022	8363	13143	10	19.7	GGD65AAL

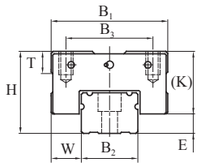


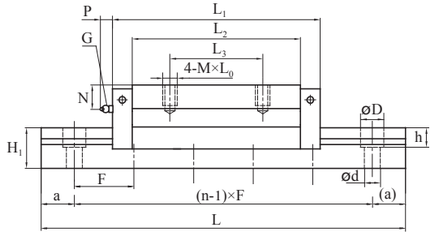
GGD BA/BALradial heavy duty rolling linear guide pair

Unit: mm

Note:
1). L_1 size is standard in seal form MN, please see seal form for details.
2). GGD series BA/BAL sliders are narrow type, and the mounting holes on the top surface of the sliders are screw holes.
3). The side view of standard slider BA and extended slider BAL is shown on the right.

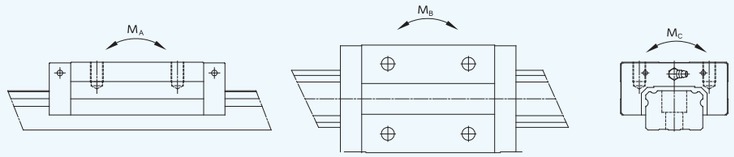






spec.	Dimension of assembly		Dimension of block									Dimension of rail	
	H	W	K	B_1	L_1	B_3	L_3	M×L_0	T	L_2	E	B_2	H_1
GGD35BA GGD35BAL	44	18	35	70	116.4 138.4	50	50 72	M8×12	12	86 108	9	34	24.2
GGD45BA GGD45BAL	52	20.5	43.1	86	143 174	60	60 80	M10×15	14.7	106 137	8.9	45	29
GGD55BA GGD55BAL	63	23.5	49	100	166 203	65	75 95	M12×17	17.7	124 161	14	53	36.5
GGD65BAL	75	31.5	60	126	257.2	76	110	M16×20	21	207	15	63	43

Dimension of rail			Smallest end size	Dimension of oil cup			ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
d×D×h	F	Max. single length L_{max}	a	G	P	N	C(KN)	C_0(KN)	M_A(N.m)	M_B(N.m)	M_C(N.m)	kg	kg/m	
9×14×12	80	6000	15	M6	14	8	76 91	121 167	1338 2258	855 1416	1807 2366	1 1.2	6	GGD35BA GGD35BAL
14×20×17	105	6000	15	M8×1	16	10	112 133	183 235	2767 4566	1725 2844	3569 4777	1.7 2.2	9.3	GGD45BA GGD45BAL
16×23×20	120	6000	15	M8×1	16	11	143 174	244 321	4255 7142	2642 4435	5684 7420	2.7 3.3	14	GGD55BA GGD55BAL
18×26×22	150	6000	20	M8×1	16	16	279	481	13022	8363	13143	7.2	19.7	GGD65BAL



GGC miniature linear guide

GGC miniature linear guide adopts two-row ball cycle design, raceway design into a Gothic structure, its contact angle is 45°, in order to achieve the effect of four directions of equal load, through optimization design, under the limited space restrictions, the use of large size steel ball to improve the load capacity, fully show the function of high load and high torque.

1. Application

Semiconductor manufacturing devices, medical devices, optical platforms, inspection devices, EDM wire-cut machine tools, computer embroidery machinery

2. Numbering rules and meaning

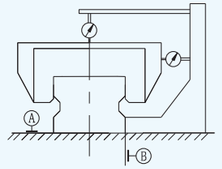
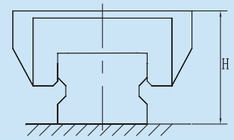
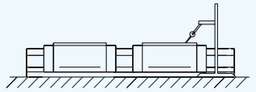
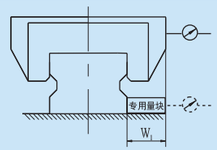
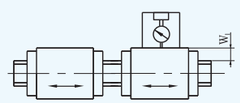
GGC 15 BA K T 2 P 2 × 500 (2) −4 −□

- Internal improvement sequence number, no mark means no internal improvement sequence number
- Accuracy: 1, 2, 3, 4, 5
- Number of long segments of single shaft2、3、4.... (No needs, no marks)
- Shaft length
- Number of shafts used in the same surface1、2、3....
- Preload type P1、P
- Number of blocks used per shaft: 1, 2, 3....
- Special requirements
- Widened form of linear guide, no marks if no needs
- Block type
- Size
- Code

Note: Shaft unit: root; Block unit: pc; Unit of linear guide: set (one shaft and all parts on the shaft are as a set)

3. Accuracy degree

Tab-1

No.	Sketch	Test Item	Tolerance				
			Shaft length (mm)	Accuracy (μm)			
				2	3	4	5
1		The parallelism of the block movement to the datum surface of the shaft: a. Parallelism of block movement to guide rail bottom datum A b. Parallelism of block movement to guide rail side datum B	≤100	2	3	7	13
			>100~200	3	4	9	15
			>200~300	4	5	10	17
			>300~400	5	6	12	19
			>400~500	6	8	14	20
2		The dimensional deviation between the top surface of the block and the height H of the base surface of the guide rail	Size	Accuracy(μm)			
				2	3	4	5
			7、9、12、15	±12	±20	±40	±80
3		The variation of the height H of the top surface of multiple blocks with the guide rail on the same plane	Size	Accuracy(μm)			
				2	3	4	5
			7、9、12、15	5	7	15	30
4		Dimension deviation W1 of the distance between the top block and the guide side reference on the same side as the guide side reference (Reference guide only)	Size	Accuracy(μm)			
				2	3	4	5
			7、9、12、15	±10	±20	±40	±150
5		Variation of reference W1 on multiple blocks and guide sides on the same guide rail (Suitable for reference guide only)	Size	Accuracy(μm)			
				2	3	4	5
			7、9、12、15	7	10	15	30

4. Preload type

Tab-2

Preload type	Application
P1 Normal preload	High repetitive positioning accuracy is required
P light preload	Movement light, transfer mechanism

GGC Miniature rolling linear guide

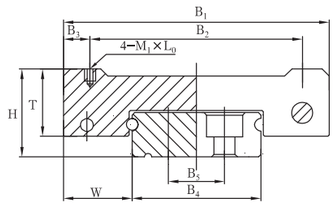
Unit: mm

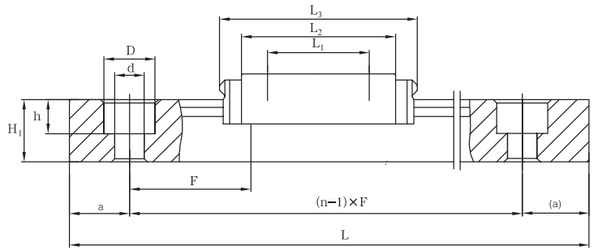
Note:

1). M_A.M_B.M_C in the table, as shown in the figure below on the right, refers to the rated static moment value of a slider.

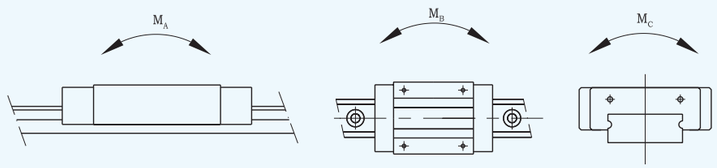
2). L_{max} in the table is the maximum length of a guide rail. For example, the length of the guide rail is to be negotiated separately (it is recommended that the guide rail be installed with holes).

3). If there is no special requirement for a single guide rail, the hole end distance is equal to both ends.





spec.	Dimension of assembly		Dimension of block								Dimension of rail					Smallest end size	ynamic load rating	Static load rating	Torque rating			Block weight	Rail weight	spec.
	H	W	T	B_1	L_3	B_2	L_1	$M_1×L_0$	B_3	L_2	B_4	H_1	B_5	dxDxh	F	a	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
GGC7BA	8	5	6.5	17	22.5	12	8	M2x2.5	2.5	13.5	7	4.8	0	2.4x4.2x2.3	15	5	0.97	1.24	2.84	2.84	4.7	0.01	0.22	GGC7BA
GGC9BA	10	5.5	8	20	28.9	15	10	M3x3	2.5	18.9	9	6.5	0	3.5x6x3.5	20	7.5	1.86	2.51	7.35	7.35	11.76	0.016	0.38	GGC9BA
GGC12BA	13	7.5	10	27	34.7	20	15	M3x3.5	3.5	21.7	12	8	0	3.5x6x4.5	25	10	2.84	3.89	13.72	13.72	25.48	0.034	0.65	GGC12BA
GGC15BA	16	8.5	12	32	42.1	25	20	M3x4	3.5	26.7	15	10	0	3.5x6x4.5	40	15	4.6	5.53	21.56	21.56	45.08	0.059	1.06	GGC15BA
GGC7BAK	9	5.5	7.1	25	31.2	19	10	M3x3	3	21	14	5.2	0	3.5x6x3.2	30	10	1.36	2.06	7.14	7.14	15.7	0.02	0.51	GGC7BAK
GGC9BAK	12	6	9.1	30	39.3	21	12	M3x3	4.5	27.5	18	7	0	3.5x6x4.5	30	10	2.76	4.12	18.96	18.96	40.12	0.04	0.91	GGC9BAK
GGC12BAK	14	8	10.6	40	46.1	28	15	M3x3.6	6	31.3	24	8.5	0	4.5x8x4.5	40	15	3.91	5.53	27.8	27.8	70.34	0.071	1.49	GGC12BAK
GGC15BAK	16	9	12.6	60	54.8	45	20	M4x4.2	7.5	38	42	9.5	23	4.5x8x4.5	40	15	6.76	9.21	56.66	56.66	199.34	0.143	2.86	GGC15BAK



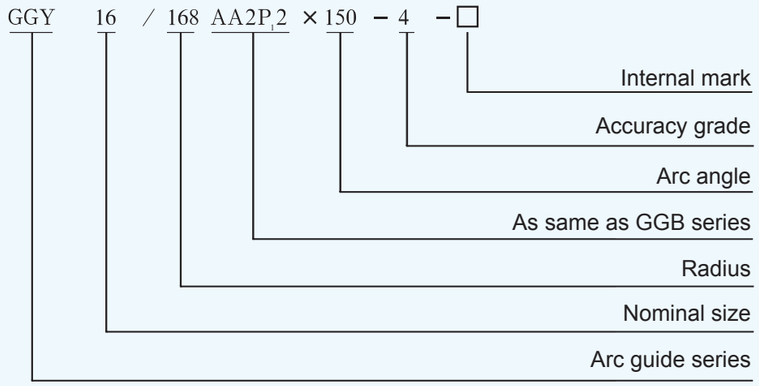
GGY arc guide

Rolling arc guide is derived from GGB precision ball linear guide. On the premise of inheriting many advantages of GGB, it can realize arc or circumferential motion of any diameter and overcome the size limitation caused by machining with bearing or rolling support and other equipment. Theoretically, it can be said that the larger the diameter of GGY arc guide, the more convenient it is to design, manufacture, install and maintain. And because of the unique structural design of GGY, it is possible to have no gap and overload.

1. Application

Large-scale transposable, control device, medical equipment, stage device, vertical lathe.

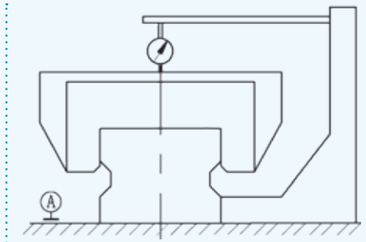
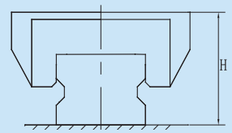
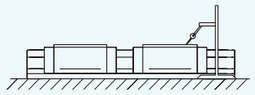
2. Numbering rules and meaning



Note: Shaft unit: root; Block unit: pc; Unit of linear guide: set (one shaft and all parts on the shaft are as a set)

3. Accuracy

Unit: μm

Item	Simple diagram	Testing items	Guideway arc length	Tolerance Accuracy 3	4	5
1		The parallelism of the center of the top surface of the block to the base of the guide rail	≤250	10	14	29
			>250~400	13	18	36
			>400~630	16	22	44
			>630~800	18	25	50
			>800~1000	21	28	56
			>1000~1250	24	33	66
			>1250~1600	29	39	78
			>1600~2000	35	46	92
2		The limit deviation of the height H between the top surface of the block and the base surface of the guide rail	Accuracy 3	4	5	
			±30	±60	±100	
3		The variation of the top height H of multiple blocks in the same surface	Accuracy 3	4	5	
			12	20	30	

4. Preload type

Unit:μm

Spec. / 种 类	Common P	General preload P1
GGY16	-3~+3	-9~-3
GGY20	-5~+5	-15~-5
GGY25	-8~+8	-24~-8
GGY30	-10~+10	-30~-10
GGY35	-14~+14	-42~-14

Note:The positive value indicates the interstice and the negative value indicates the amount of interference.

GGY arc guide

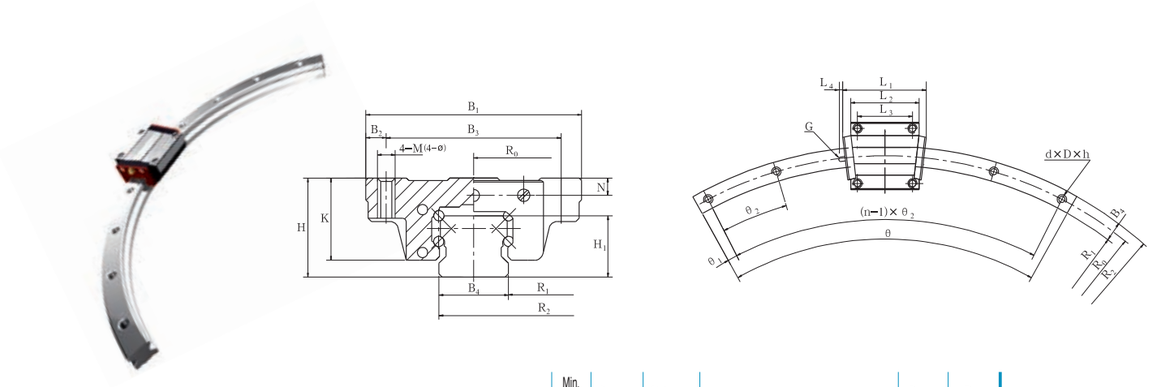
5. Size

Note:

1). MA.MB.MC mean rated torque of a block.

2). We can produce R0 in according to customer's requirements, following table shows developed products.

3). Different arc guide can be connected to one circle.



Unit: mm

Spec.	Dimesion		Dimension of block									Dimension of oil cup		Dimension of rail							Min. termina langle	Dynamic load rating	Static load rating	Torque force			Block Weight	Rail Weight	Spec.
	H	B_1	B_2	B_3	K	L_1	L_2	L_3	M	ø	L_4	G	N	B_4	H_1	d×D×h	θ_2	R_0	R_1	R_2	θ_{max}	θ_1	C(kN)	C_0(kN)	M_A(N·m)	M_B(N·m)	M_C(N·m)	kg	kg/m	
GGY16/168AA(AB)	24	47	4.5	38	19.4	58	40.5	30	M5	4.5	7	M4	4	16	15	4.5×7.5×5.3	15°	168	160	176	160°	3°	5.67	6.35	51.8	51.8	82.9	0.2	1.5	GGY16/168AA(AB)
GGY16/228AA(AB)	24	47	4.5	38	19.4	58	40.5	30	M5	4.5	7	M4	4	16	15	4.5×7.5×5.3	15°	228	220	236	160°	3°	5.67	6.35	51.8	51.8	82.9	0.2	1.5	GGY16/228AA(AB)
GGY16/300AA(AB)	24	47	4.5	38	19.4	58	40.5	30	M5	4.5	7	M4	4	16	15	4.5×7.5×5.3	15°	300	292	308	75°	2°	5.67	6.35	51.8	51.8	82.9	0.2	1.5	GGY16/300AA(AB)
GGY16/390AA(AB)	24	47	4.5	38	19.4	58	40.5	30	M5	4.5	7	M4	4	16	15	4.5×7.5×5.3	15°	390	382	398	65°	2°	5.67	6.35	51.8	51.8	82.9	0.2	1.5	GGY16/390AA(AB)
GGY25/230AA(AB)	36	70	6.5	57	28.8	79.5	59	45	M8	7	11	M6	6	23	22	7×11×9	15°	230	218.5	241.5	160°	3°	16.8	21.5	142.2	142.2	233.5	0.99	3.3	GGY25/230AA(AB)
GGY25/400AA(AB)	36	70	6.5	57	28.8	79.5	59	45	M8	7	11	M6	6	23	22	7×11×9	10°	400	388.5	411.5	60°	2°	16.8	21.5	142.2	142.2	233.5	0.99	3.3	GGY25/400AA(AB)
GGY25/500AA(AB)	36	70	6.5	57	28.8	79.5	59	45	M8	7	11	M6	6	23	22	7×11×9	7°	500	488.5	511.5	60°	2°	16.8	21.5	142.2	142.2	233.5	0.99	3.3	GGY25/500AA(AB)
GGY25/750AA(AB)	36	70	6.5	57	28.8	79.5	59	45	M8	7	11	M6	6	23	22	7×11×9	5°	750	738.5	751.5	35°	2°	16.8	21.5	142.2	142.2	233.5	0.99	3.3	GGY25/750AA(AB)
GGY25/1000AA(AB)	36	70	6.5	57	28.8	79.5	59	45	M8	7	11	M6	6	23	22	7×11×9	4°	1000	988.5	1011.5	28°	2°	16.8	21.5	142.2	142.2	233.5	0.99	3.3	GGY25/1000AA(AB)
GGY35/600AA(AB)	48	100	9	82	38	111	81	58	M10	11	11	M6	8	34	29	9×14×12	9°	600	583	617	60°	3°	34.97	58.53	610	610	1030	1.4	6.5	GGY35/600AA(AB)
GGY35/800AA(AB)	48	100	9	82	38	111	81	58	M10	11	11	M6	8	34	29	9×14×12	5.5°	800	783	817	35°	2°	34.97	58.53	610	610	1030	1.4	6.5	GGY35/800AA(AB)
GGY35/1000AA(AB)	48	100	9	82	38	111	81	58	M10	11	11	M6	8	34	29	9×14×12	5°	1000	983	1017	28°	2°	34.97	58.53	610	610	1030	1.4	6.5	GGY35/1000AA(AB)
GGY35/1300AA(AB)	48	100	9	82	38	111	81	58	M10	11	11	M6	8	34	29	9×14×12	3.5°	1300	1283	1317	22°	2°	34.97	58.53	610	610	1030	1.4	6.5	GGY35/1300AA(AB)
GGY45/800AA(AB)	60	120	10	100	49	138	102.8	70	M12	13	14	M8	12	45	38	14×20×17	8°	800	777.5	822.5	36°	2°	74.8	101.2	1290	1290	2100	4.3	15	GGY45/800AA(AB)
GGY45/3600AA(AB)	60	120	10	100	49	138	102.8	70	M12	13	14	M8	12	45	38	14×20×17	1.6°	3600	3577.5	3622.5	8°	0.5°	74.8	101.2	1290	1290	2100	4.3	15	GGY45/3600AA(AB)
GGY65/2000AA (AB)	90	170	14	142	76	197	147	106	M16	16	14	M8	12	63	53	18×26×22	4°	2000	1968.5	2031.5	14°	1°	191.8	237.5	4170	4170	6800	7.3	22.2	GGY65/2000AA(AB)
GGY65/3105AA (AB)	90	170	14	142	76	197	147	106	M16	16	14	M8	12	63	53	18×26×22	3°	3105	3073.5	3136.5	9°	0.5°	191.8	237.5	4170	4170	6800	7.3	22.2	GGY65/3105AA(AB)

GZD roller guide block

1. Product description

- Roller guide block is a kind of precision linear motion rolling element, with high bearing capacity and high rigidity, in the case of repeated action, start, stop, reciprocating movement frequency is high, can reduce the weight of the whole machine and transmission mechanism and power costs.
- Roller guide block for high sensitivity and high performance of flat linear motion. In the case of heavy load or variable load, the elastic deformation is small and smooth linear motion can be obtained without crawling.
- Roller guide block because of its rolling body - roller in the rolling guide good, can automatically centering, so it can improve the positioning accuracy of the machine.
- Rollers in the roller guide block circulate in the matrix, so the rolling guide block is used, which is not limited by the length of the machine bed, and the number of guide blocks can be determined according to the bearing size and selection specifications.
- Roller guide block has a wide range of applications, small specifications can be used in molds, instruments and other linear moving parts, large specifications can be used for heavy machine tools, precision instruments flat linear motion, especially suitable for NC, CNC machine tools.

2. Basic structure

The roller guide block is mainly composed of a slide block, a roller and a returner.The roller moves in an infinite cycle in a hardened and finely ground slider.In order to prevent the roller from falling off from the slider, the roller is designed as a step roller, and the slider is designed with a special card slot, so that the roller has an automatic centering function and does not deviate during movement, which is conducive to flexible movement under the action of load and long service life.

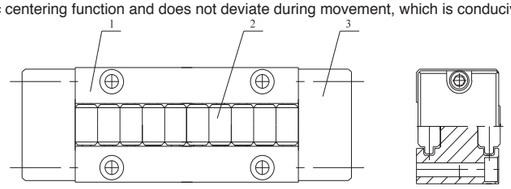


FIG-1

1. Slide 2. Roller 3.Reversing device

3. Accuracy

The accuracy of the roller guide block is mainly determined by the height of the guide block. For multiple roller guide blocks used in the same plane, in order to obtain a balanced load distribution, the height and size of the roller guide blocks in the same group must be ensured. Generally, the height deviation ranges from 0 to -10μm. The height and size variation of the paired roller guide block is shown in Table -1.

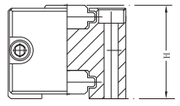


FIG-2

Tab-1 Precision specifications for height dimensions *Unit: μm*

Precision class	Allowable error of height dimension H	The variation of height size H in the same group
2	0~-10	2
3		3
4		5
5		10

Tab-2 Classification errors of height dimension H *Unit: μm*

Precision class	2		3		4		5	
	Class numbering	Height deviation	Class numbering	Height deviation	Class numbering	Height deviation	Class numbering	Height deviation
Precision	B2	0~-2	C3	0~-3	D5	0~-5	-	0~-10
	B4	-2~-4	C6	-3~-6	D10	-5~-10		
	B6	-4~-6	C9	-6~-9				
	B8	-6~-8						
	B10	-8~-10						

- The variation of the height size H in the same group refers to the deviation between the maximum size and the minimum size of the height size H of multiple roller guide blocks used on the same plane.
- When ordering, please indicate the number of roller guide blocks used in the same plane.

The manufacturer is graded according to the accuracy level, except for the 5 level accuracy, the remaining accuracy is graded according to the height size, and the same number is the same group when installing.The user only needs to specify the precision level when ordering, and does not need to specify the classification number

4. Rated load and life

- Basic rated dynamic load C

The basic rated dynamic load is a set of roller guide blocks of the same specifications run separately, of which 90% can reach the rated life of 100 km, the rolling body will not be damaged by contact fatigue, the direction and quantity of the load constant is called the basic rated dynamic load.

- Basic rated static load C_0

The basic static load rating is defined as the static load, which gives the maximum load obtained at the constant contact stress specified at the center of the contact zone between the rolling element and the guide rail.

- Life calculation

1) Calculation of life

Life calculation formula of roller guide block: $$L=100\times\left(\frac{f_h f_t f_c f_a}{f_w}\cdot\frac{C}{P_c}\right)^{10/3}\ (km)$$

L - Rated life (km) C - Rated dynamic load (kN) P_c - Calculated load (kN) f_t - Temperature coefficient
f_c - Contact coefficient f_a - Precision coefficient f_w - Load coefficient f_h - hardness coefficient (actual hardness of raceway HRC/58)$^{3.6}$
The selection of f_t, f_c, f_a, and f_w data refer to P32.

2) Calculation of life time $$L_h=\frac{L\times10^6}{2\times l\times n\times60}\ (h)$$

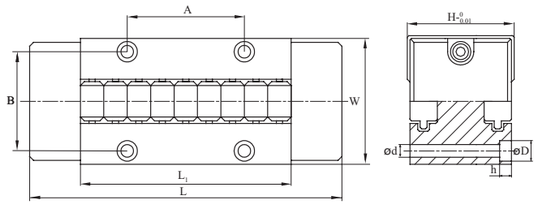
L_h- Life time (h) L - stroke length (mm) n- number of cycles per minute (min-1) L - Rated life (km)

5. Numbering rules and meaning

GZD 15 × 53 – Ⅱ – 3 – C6 – □

- Company internal improvement serial number, no time is not standard
- Class numbering
- Precision class
- Number of guide rails used in the same plane
- Length of guide block
- Nominal size of guide block
- Ball guide block code

6. size series



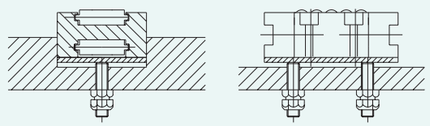
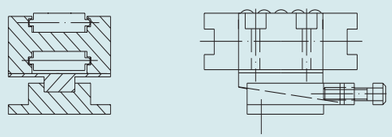
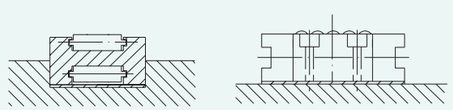
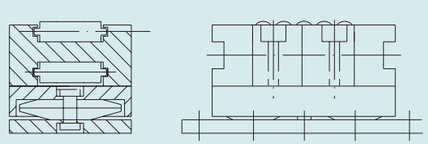
Tab-3 *Unit: mm*

Model number	Overall length	Slider length	Breadth	Altitude	Mounting hole diameter	Center distance of mounting holes		Dynamic load rating	Static load rating	weight(kg)
	L	L_1	W	H	d×D×h	A	B	C(kN)	C_0(kN)	Sliders/one
GZD15×53	52.8	33.1	26.5	15	ø 3.4×ø 6×4	19	19.3	23.0	29.0	0.12
GZD20×70	70	45.3	30	20	ø 3.6×ø 6×4	26	23	38.3	53.4	0.25
GZD30×123	123	87	40	30	ø 4.5×ø 8.5×5	58	30	63.5	72.3	0.92
GZD40×132	132	80.1	51.4	40	ø 5.5×ø10×6	50.8	41.5	89.1	121	1.7

7. Lnstallation and use

When installing the roller guide block, the assembly accuracy and parallelism between the guide block and the guide rail must be ensured. Table 4 describes the common installation methods of roller guide blocks on machine tool guide rails. In order to give full play to the performance of the guide block, the bed guide surface must be hardened to HRC58 or above, the surface roughness > Ra0.4~0.8μm, and the depth of the hardened layer must reach 1~2mm.

Tab-4 Common methods for installing roller guide blocks on guide rails

NO.	Installation Method	Diagram Features	Peculiarity
1	Direct mounting		The structure is simple, but the precision of parts manufacturing is high
2	Install on the backing plate		The size can be controlled by the precision of the matching pad
3	Mounted on wedge iron		Easy to adjust
4	Mount on adjustable gasket		There is no need to finish the mounting surface, but it is time-consuming to adjust the accuracy
5	Installed on the spring pad		Because the spring has automatic compensation, the manufacturing accuracy of the parts is low, but the force can not exceed the preload of the spring

In order for the rail block to achieve the desired performance and durability, the following installation and adjustment accuracy must be guaranteed.

(1) Parallelism between the mounting surface and the guide rail surface: To make the guide rail block of the machine tool guide pair evenly stressed, the parallelism tolerance between the installation datum surface of the guide rail and the rolling contact surface of the machine tool guide rail should be controlled within 0.02mm/1000mm.

(2) Guide block roller length direction tilt accuracy: In order to ensure that the guide block in the operation process, the roller does not appear lateral deviation and slip phenomenon, along the guide block roller length direction and the machine tool installation datum should be controlled within 0.02mm/300mm.

(3) The side tilt accuracy of the guide rail block: In order to avoid the lateral deviation of the roller during the movement and slip, the parallelism between the axis direction of the roller along the direction of the guide rail block and the left and right directions of the rolling surface should be controlled within 0.02mm/300mm, the higher the positioning accuracy, the stricter the tilt accuracy control.

8. Lubrication

The main purpose of lubrication is to reduce friction and wear to prevent overheating, damaging its internal structure and affecting the movement function of the guide block.When the running speed of the roller guide block is high speed (V≥15m/min), it is recommended to use lubricating oil legularly or forced lubrication of twbring.

At low speed (v< 15m/min), it is the commended to use special grease for bearing: However, ordinary butter containing large solid. Lubricating particles (such as graphite and holybdenum disulfide) should not be used.

Ball screw assembly is consisted of screw, nut and ball. The function is transfer the rotary motion into linear motion or transfer the linear motion into rotary motion. This is further extension and development of slide ball screw. The important signi cance of development is as same as change of bearing from rolling motion to sliding motion. Because of excellent friction function, ball screw is widely used for all kinds of industrial equipments and precision instrument.

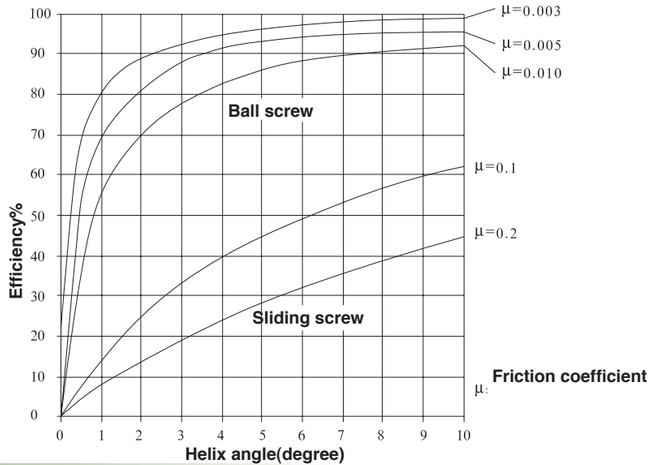
Since 1964, the company developed the China's rst ball screw, it has on the leading position in China in the research and manufacture of ball screw. In order to meet the development of CNC machine tools, the company established "large, heavy-load, high-speed, high-precision" of product development direction. In product development, we opened DKFZD End-cap high-speed high-precision ball screw and JF/JFZD large and heavy load ballscrew. completely new products with independent intellectual property rights, declaration and licensing patents, total 14 items, In processing technology, it is the rst application of technology in induction hardening of ball screw on heat treatment which greatly enhanced the production ef ciency. In recent years, the company has changed decades of traditional process techniques, improved the productivity and quality and greatly reduced the product lead time by successful introduction of the world-class processing technology of high-speed hard whirling from German company. Using pre-process with de ned length, the lead time can be shortened to 15 days.

At present, the company can produce the ball screw min. dia. of 6 mm, min. lead 1mm; max. dia. 245mm; max. single length 10m, max. load more than 125 ton which of various applications; it can provide a mass of 1.5m p0 grade, 2 m P1 grade, 4m P2 grade; 5m P3 grade; 10m P5 grade various ball screws, it's the professional ball screw manufacturer of all speci cations.

Features

1. High transmission ef ciency

Balls with free motion transfer the force and motion between screw and nut in the ball screw assembly. This transfer wise replaces the traditional direct function wise between screw and nut. Therefore the minimum rolling friction takes the place of the sliding friction of traditional ball screw. The transfer ef ciency of ball screw will reach more than 90%. The drive torque of transfer unit reduces to 1/3 of sliding screw. This reduces the heat rate largely.



2. High positioning accuracy

Ball screw has low heat rate and small temperature increase. In the machining the measures have been taken to prolong and preload so as to avoid axial clearance. Ball screw has high positioning accuracy and repeating positioning accuracy.

3. Reversibility

Ball screw has not sticky friction of sliding screw. It clears crawl which exist during transference. Ball screw can realize two transfer wise—from rotary motion to linear motion and from linear motion to rotary motion—and transfer momentum.

4. Long service life

Because of strict control of shape of running track, surface hardness and material, the actual life of ball screw is much longer than sliding screw.

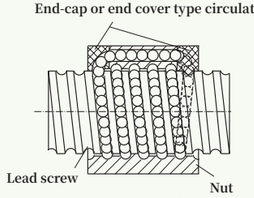
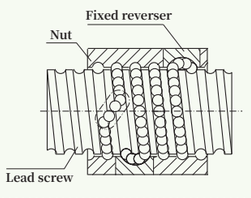
5. Good synchronization

Due to smooth running, avoidance of axial clearance and consistency of manufacture, several sets of ball screw can drive same unit or several same parts. The synchronization is good.

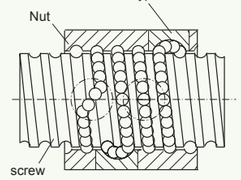
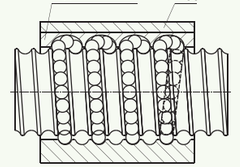
Structure of ball screw

Circulation mode

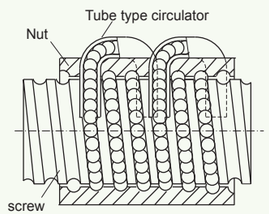
Tab-1

Circulation mode	Inner cycle, End-cap type (DK)	Internal cycle fixed (N)
Con guration	End-cap or end cover type circulator 	Fixed reverser Nut 
	n=5x1=5 Number of turns n1: indicates that the number of turns from one end of the inverter outlet to the other end of the inverter inlet is fixed at 5 turns. Helix number m: 1 , Number of reversers n2: 2, Total number of turns n: n=n1xm, n=5x1=5	Number of turns n1: indicates that the number of turns from the exit of each reversing device to the entrance of the other end of the same reversing device is fixed as 1 turn, the number of spirals m: 1, Number of reversers n2: 4, Total number of turns n: n=n1x n2xm, n=1x4x1=4
Trait	Smooth ball movement, suitable for high-speed motion applications A complete ball cycle chain contains multiple turns	The nut mounting size is small, suitable for medium and small leads, medium and low speeds, and a complete ball cycle chain has only one turn number
Out dia. of nut	Small	
Number of circulation	All kinds of choice (Generally≤6)	All kinds of choice (Generally≤8)
Number of columns	Generally=1	Generally=1

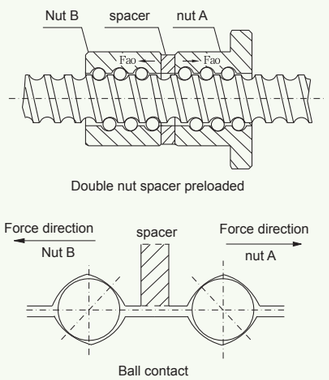
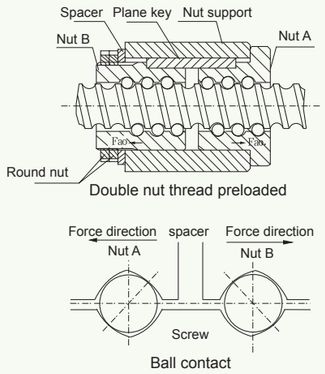
Circulation mode

Circulation mode	Inner cycle, Float type (F)	Inner cycle, Matrix type(J)
Con guration	Float type circulator Nut 	Matrix type circulator nut 
	Number of circulation n1: the number of circulation from the exit of one circulator to the enter of the other circulator is one circulation Number of columns m: number of circulators Number of reverser n_2: 4 Total number of circulation n: $n=n_1xn_2xm$ Fig. shown:n=1x4x1=4	
trait	Small mounting dimension of nut, apply to middle and small lead, middle and low speed, manufacture technology relatively simple	
Out dia. of nut	small	
Number of circulation	All kinds of choice (Generally≤8)	
Number of columns	1	

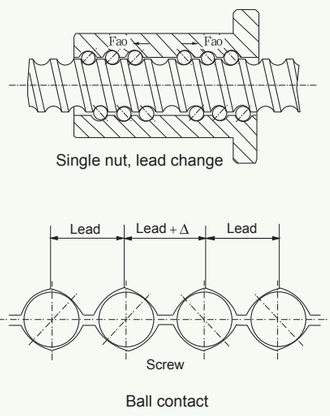
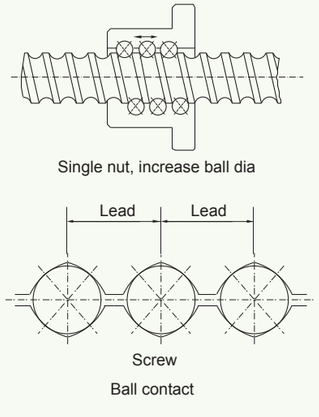
Circulation mode

Circulation mode	External cycle, tube type(C)
Con guration	Tube type circulator Nut  Number of circulation n1: the number of circulation from the exit of one tube to the enter of the other tube Fig shown: 2.5 Number of columns m: 1 Number of reverser n_2: 2 Total number of circulation n: $n= n_1xn_2xm$ Fig shown: n=2.5x1x2=5
trait	Large mounting dimension of nut, widely used, manufacture technology relatively complex
Out dia. of nut	big
Number of circulation	All kinds of choice
Number of columns	Generally=1

Preload mode

Preload mode	Double nuts, preloaded by spacer (D)	Double nuts, preloaded by thread(L)
configuration		
trait	Most widely used,with suitable pre-tightness force	Used in middle and low accuracy and speed, customer can adjust the pre-tightness force by themselves.
Nut length	Little long	long

Preload mode

Preload mode	Single nut, lead change(B)	Single nut, increase ball dia. (Z)
		
trait	Apply to middle and high accuracy, low load situation	Apply to low accuracy and load situation
Nut length	middle	short

Production range of ball screw

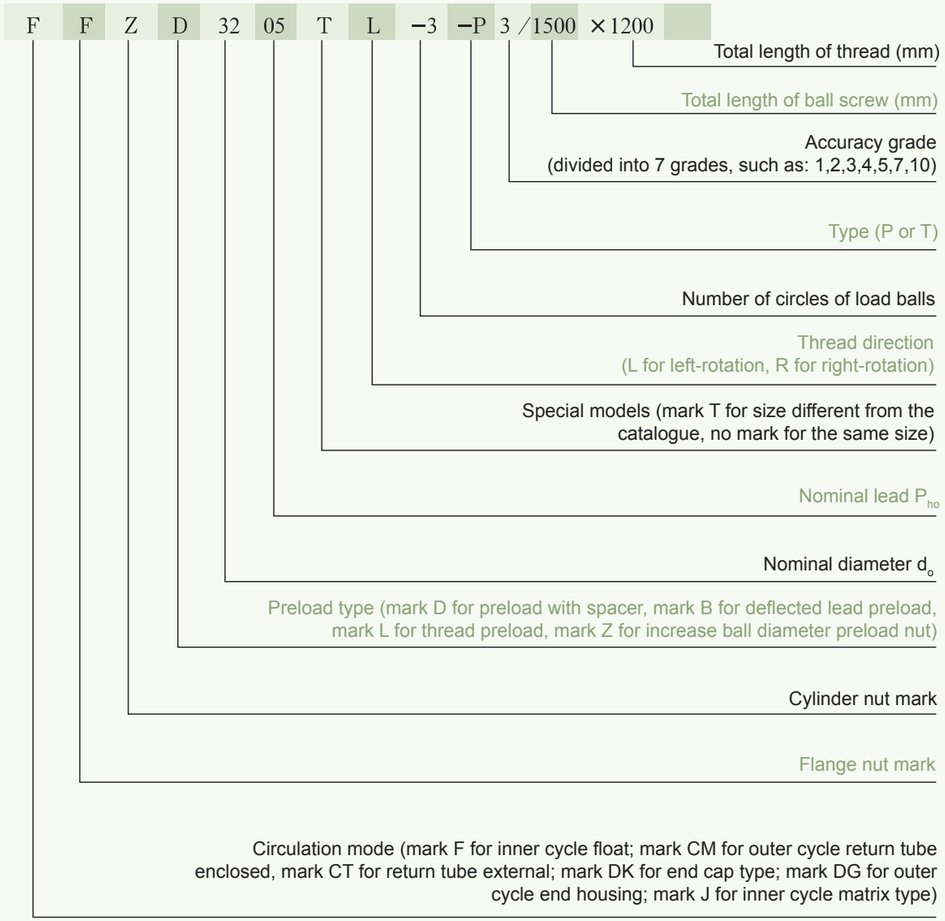
unit: mm

Tab-1

Accuracy grade / Length range / Nominal dia.	<300	300~400	400~500	500~700	700~1000	1000~1500	1500~2000	2000~2500	2500~3000	3000~3500	3500~4000	4000~5000	5000~6000	6000~7000	7000~8000	8000~10000	>10000
6~12	1	3	7														
12	1	3	5	7													
16	0	3	5	7													
20		0	3	5	7												
25		0			1	3	5										
32			0			1	3		5								
40			0				1	3		5							
50			0				1		3		5						
63			0				1		2			3					
80			1					2		3			5				
100			1					2		3			5				
120			1					2		3			5		7		
125			1					2		3			5		7		
160			1					2		3			5		7		7

Code rule and de nition

Code rule of ball screw



Ball screw structure type

AZI precision ball screws are standardized to 10 nut types. In addition, in order to meet customer requirements, we can make special shapes (such as square, axis intersection, etc.), special properties (such as high temperature resistance, corrosion resistance, etc.) and abnormal specifications (such as extension, heavy load) and other non-standard nuts. If there is any need, please contact us.

Lead accuracy of ball screw assembly

Accuracy grade

Ball screw assembly is divided into positioning BSA(P) and transmission BSA (T). There are seven accuracy grades, that is 1, 2, 3, 4, 5, 7, 10.
The highest precision is grade one, then lowering one by one.
Travel deviation and travel alteration (see fig-1 and tab-2)

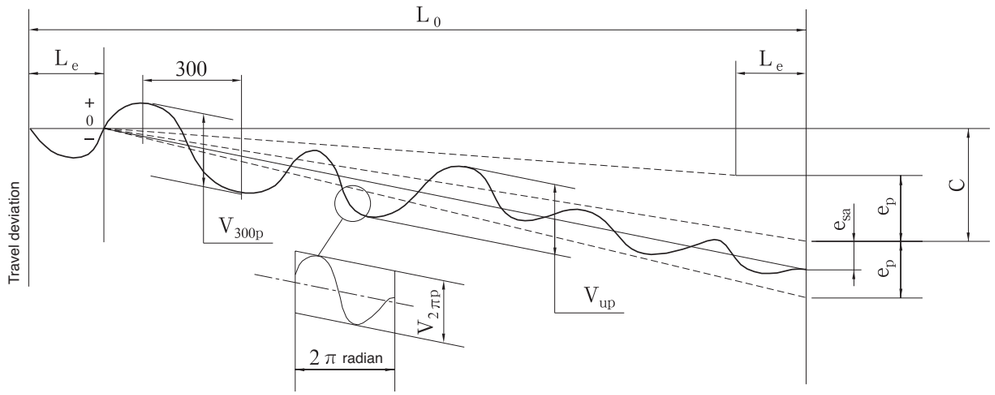


Fig-1

Tab-2 Travel deviation and travel alteration(from GB/T 17587.3-1998) *unit:μm*

No.	Testing content	Symbol	Effective travel distance(mm)	Accuracy grade							
				0	1	2	3	4	5	7	10
1	Travel alteration over any travel distance 300mm	V_{300p}	—	3.5	6	8	12	16	23	52	210
2	Travel alteration in one-revolution(only applied for P type)	$V_{2πp}$	only applied for P type	3	4	5	6	7	8	—	—
3	Average travel deviation within effective travel distance IU (only applied for P type)	e_p	≤315	4	6	8	12	16	23	—	—
			>315 ~ 400	5	7	9	13	18	25	—	—
			>400 ~ 500	6	8	10	15	20	27	—	—
			>500 ~ 630	6	9	11	16	22	32	—	—
			>630 ~ 800	7	10	13	18	25	36	—	—
			>800 ~ 1000	8	11	15	21	29	40	—	—
			>1000 ~ 1250	9	13	18	24	34	47	—	—
			>1250 ~ 1600	11	15	21	29	40	55	—	—
			>1600 ~ 2000	—	18	25	35	48	65	—	—
			>2000 ~ 2500	—	22	30	41	57	78	—	—
			>2500 ~ 3150	—	26	36	50	69	96	—	—
			>3150 ~ 4000	—	32	45	62	86	115	—	—
			>4000 ~ 5000	—	—	—	76	110	140	—	
			>5000 ~ 6300	—	—	—	—	—	170	—	—
	Average travel deviation within effective travel distance L_u (only applied for T type)	e_p	$e_p = \frac{2L_u}{300} V_{300p}$	Notes:1. Travel compensation C=0 2. As for V_{300p} see No.1							

No.	Testing content	Symbol	Effective travel distance(mm)	Accuracy grade							
				0	1	2	3	4	5	7	10
4	Travel deviation within effective travel distance L_u (only applied for P type)	V_{up}	≤315	3.5	6	8	12	16	23	—	—
			>315 ~ 400	3.5	6	9	12	18	25	—	—
			>400 ~ 500	4	7	9	13	19	26	—	—
			>500 ~ 630	4	7	10	14	20	29	—	—
			>630 ~ 800	5	8	11	16	22	31	—	—
			>800 ~ 1000	6	9	12	17	24	34	—	—
			>1000 ~ 1250	6	10	14	19	27	39	—	—
			>1250 ~ 1600	7	11	16	22	31	44	—	—
			>1600 ~ 2000	—	13	18	25	36	51	—	—
			>2000 ~ 2500	—	15	21	29	41	59	—	—
			>2500 ~ 3150	—	17	24	34	49	69	—	—
			>3150 ~ 4000	—	21	29	41	58	82	—	—
			>4000 ~ 5000	—	—	—	49	70	99	—	
			>5000 ~ 6300	—	—	—	—	—	119	—	—
			Note: 1.Travel deviation L_u for T type doesn't need to test. 2.If the thread length is longer than 6300mm, please contact us.								

Effective travel distance L_u can be calculated as per below formula (Unit: mm)

$$L_u = L_1 - 2L_e$$

In formula: L_u– effective travel distance, mm L_1– total length of screw thread, mm L_e– remaining distance (see tab-3), mm

Tab-3 *Unit: mm*

Nominal lead	$2.5 \leqslant P_{h0} \leqslant 12$	$12 < P_{h0} < 40$	40
Remaining distance(L_e)	$4P_{h0}$	$3P_{h0}$	$2.5P_{h0}$

Position tolerance of installation reference surface for ball screw (see fig-2 and tab-4)

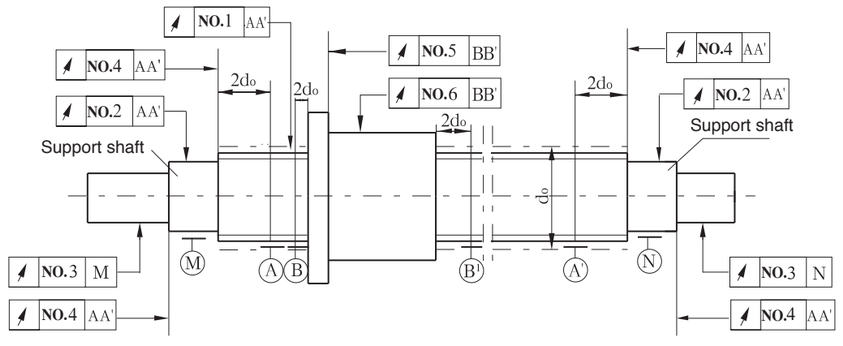
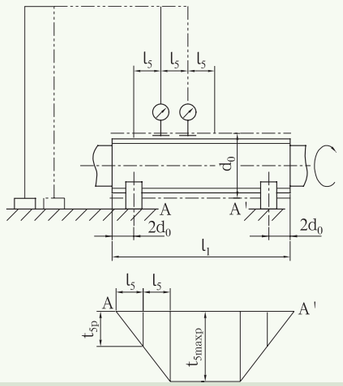
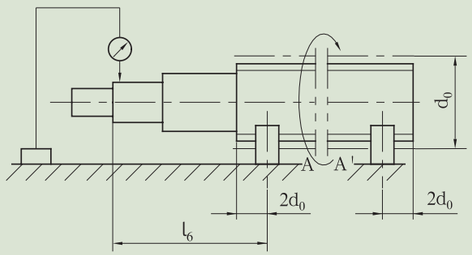
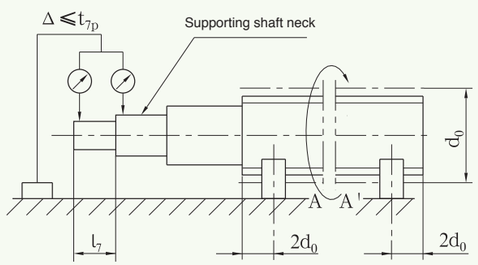
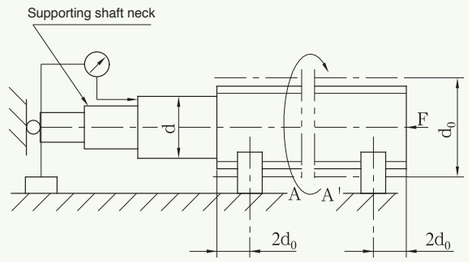
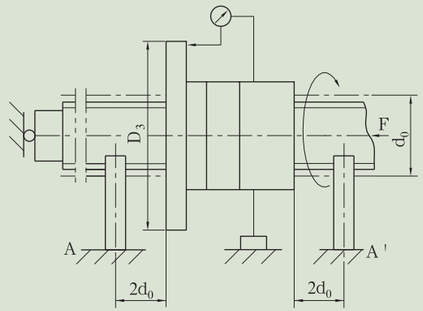
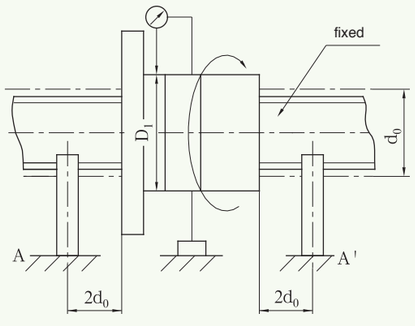
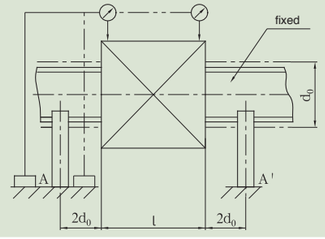


Fig-2

Tab-4 (From GB/T 17587.3-1998)

<table>
<tr><th>Serial number</th><th>Diagram</th><th>Testing item</th><th>Tolerance</th><th>Testing tool</th><th>Testing explanation
According to relevant
clause of GB/T 10931.1</th></tr>
<tr><td>1</td><td>  </td><td>Radical jumping of outer diameter of ball screw in each l_5 length is t_s, so that the straightness toward AA' can be determined.</td><td>Ball screw for positioning and transmission
Nominal diameter d_0 mm | l_5 mm | Standard tolerance grade 0 1 2 3 4 5 7 10 | t_{sp},um in l_5 length
≥6~12 | 80 | 16 20 22 25 28 32 40 80
>12~25 | 160
>25~50 | 315
>50~100 | 630
>100~200 | 1250
Ratio of length and diameter l_1/d_0 | t_{smaxp} of length $l_1 \geq 4\ l_5$, μm
≤40 | 32 40 45 50 57 64 80 160
>40~60 | 48 60 67 75 85 96 120 240
>60~80 | 80 100 112 125 142 160 200 400
>80~100 | 128 160 180 200 225 256 320 640</td><td>Indicator, double V-type iron with same height</td><td>5.612.2
Putting ball screw on V-type iron in AA'. Adjusting indicator so that its finder contacts cylinder surface vertically in l_5. Turning ball screw slowly, writing down the reading variety on indicator. Repeating test in stated test distance.
Notice:
1. according to negotiation it is allowable to test with holding center hole of ball screw. Here l_1 is total length of ball screw.
2. If l_1 is <2 l_5, it will be tested in $l_1/2$.</td></tr>
<tr><td>2</td><td>  </td><td>Radical jumping of supporting shaft neck towards AA' in each l length. If l_6 is ≤t, it is t_6; if $l_6 > l$, its virtual value is $t_{6a} \leq t_{6p} \frac{l_6}{l}$</td><td>Ball screw of positioning or transmission
Nominal diameter d_0 mm | l mm | Standard tolerance grade 0 1 2 3 4 5 7 10 | t_{6p}, μm in l length
≥6~20 | 80 | — 10 11 12 16 20 40 63
>20~50 | 125 | — 12 14 16 20 25 50 80
>50~125 | 200 | — 16 18 20 26 32 63 100
>125~200 | 315 | — — — 25 32 40 80 125</td><td>Indicator, double V-type iron with same height</td><td>5.612.2
Putting ball screw on V-type iron in AA'. The indicator finder contacts cylinder surface vertically in l_6. Turning ball screw slowly, writing down the reading variety on indicator. Repeating test in stated test distance.
Notice:
according to negotiation it is allowable to test with holding center hole of ball screw. Here l_0 is distance from test point to shaft end.</td></tr>
<tr><td>3</td><td>  </td><td>Radical jumping of shaft neck towards supporting shaft neck. If $l_7 \leq l$, it is t_7; if $l_7 > l$, its virtual value is $t_{7a} \leq t_{7p}\ l_7/l$.</td><td>Ball screw of positioning or transmission
Nominal diameter d_0 mm | l mm | Standard tolerance grade 0 1 2 3 4 5 7 10 | T_{7p}, μm in l length
≥6~20 | 80 | — 5 6 6 7 8 12 16
>20~50 | 125 | — 6 7 8 9 10 16 20
>50~125 | 200 | — 8 9 10 11 12 20 25
>125~200 | 315 | — — — 12 14 16 25 32</td><td>Indicator, double V-type iron with same height</td><td>5.612.2
Putting ball screw on V-type iron in AA'. Adjusting indicator so that its finder contacts cylinder surface vertically in l_7. Moving ball screw slowly, write down the reading variety on indicator.
Notice:
according to negotiation it is allowable to test with holding center hole of ball screw.</td></tr>
</table>

Serial number	Diagram	Testing item	Tolerance	Testing tool	Testing explanation According to relevant clause of GB/T 10931.1
4		Plane jumping t_9 of supporting neck towards AA'	Ball screw for positioning and transmission Nominal diameter d_0 mm / Standard tolerance grade 0 1 2 3 4 5 7 10 / t_{9p} μm ≥6~63 — 3 4 4 5 5 6 10 >63~125 — 4 5 5 6 6 8 12 >125~200 — — 6 6 7 8 10 16	Indicator, double V-type iron with same height	5.612.2 Putting ball screw in AA' on V-type iron. Avoiding ball screw from axial move (putting ball between center hole of ball screw and fixing surface) Adjusting indicator so that its finder contacts relative diameter between shaft neck and cylinder surface.. Turning ball screw, write down the reading variety on indicator. Notice: according to negotiation it is allowable to test with holding center hole of ball screw.
5		Surface jumping t_9 of nut mounting surface towards AA' (only for nut with preload)	Ball screw of positioning or transmission Diameter of nut mounting surface D_3 mm / Standard tolerance grade 0 1 2 3 4 5 7 10 / t_{9p} μm ≥16~32 8 10 11 12 14 16 20 — >32~63 10 12 14 16 18 20 25 — >63~125 12 16 18 20 22 25 32 — >125~250 16 20 22 25 28 32 40 — >250~500 — — — 32 36 40 50 —	Indicator, double V-type iron with same height	5.632 Putting ball screw with preload in AA' on V-type iron so as to avoid axial move of ball screw (putting ball between center hole of ball screw and fixed surface). Let the finder of indicator contact mounting surface of flange of nut diameter D_3 vertically. The nut does not move. Turning ball screw slowly and write down the reading variety on indicator.
6		Radical jumping t_{10} of nut mounting diameter towards AA' (only for nut with preload and rotation nut)	Ball screw of positioning or transmission Outer diameter of but D_1 mm / Standard tolerance grade 0 1 2 3 4 5 7 10 / t_{10p} μm ≥16~32 8 10 11 12 14 16 20 — >32~63 10 12 14 16 18 20 25 — >63~125 12 16 18 20 22 25 32 — >125~250 16 20 23 25 28 32 40 — >250~500 — — — 32 36 40 50 —	Indicator, double V-type iron with same height	5.612.2 Putting ball screw with preload in AA' on V-type iron. Let finder of indicator contact cylinder surface of nut mounting diameter D_1 vertically. Fixing ball screw and turning nut slowly, write down the reading variety on indicator.
7		Parallelism t_{11} of rectangular nut towards AA' (only for nut with preload)	Ball screw for positioning and transmission Standard tolerance grade 1 2 3 4 5 7 10 t_p, um in length of 100mm 16 18 20 22 25 32 —	Indicator, double V-type iron with same height	5.412.2 Putting ball screw with preload in AA' on V-type iron. Let finder of indicator contact tested surface vertically. Test along stated length l and write down the reading variety on indicator.

Various machine accuracy grade

The following table is an example of selecting accuracy levels for different purposes according to the actual experience of the company. ○ Mark indicates the range of accuracy levels that are used more.Through this table, the accuracy level of the ball screw can be preliminarily selected.In addition, the accuracy level of the ball screw pair that meets the actual positioning accuracy requirements can be confirmed by the list of "travel deviations and variations" (Table -4 on page P76)

Tab-7

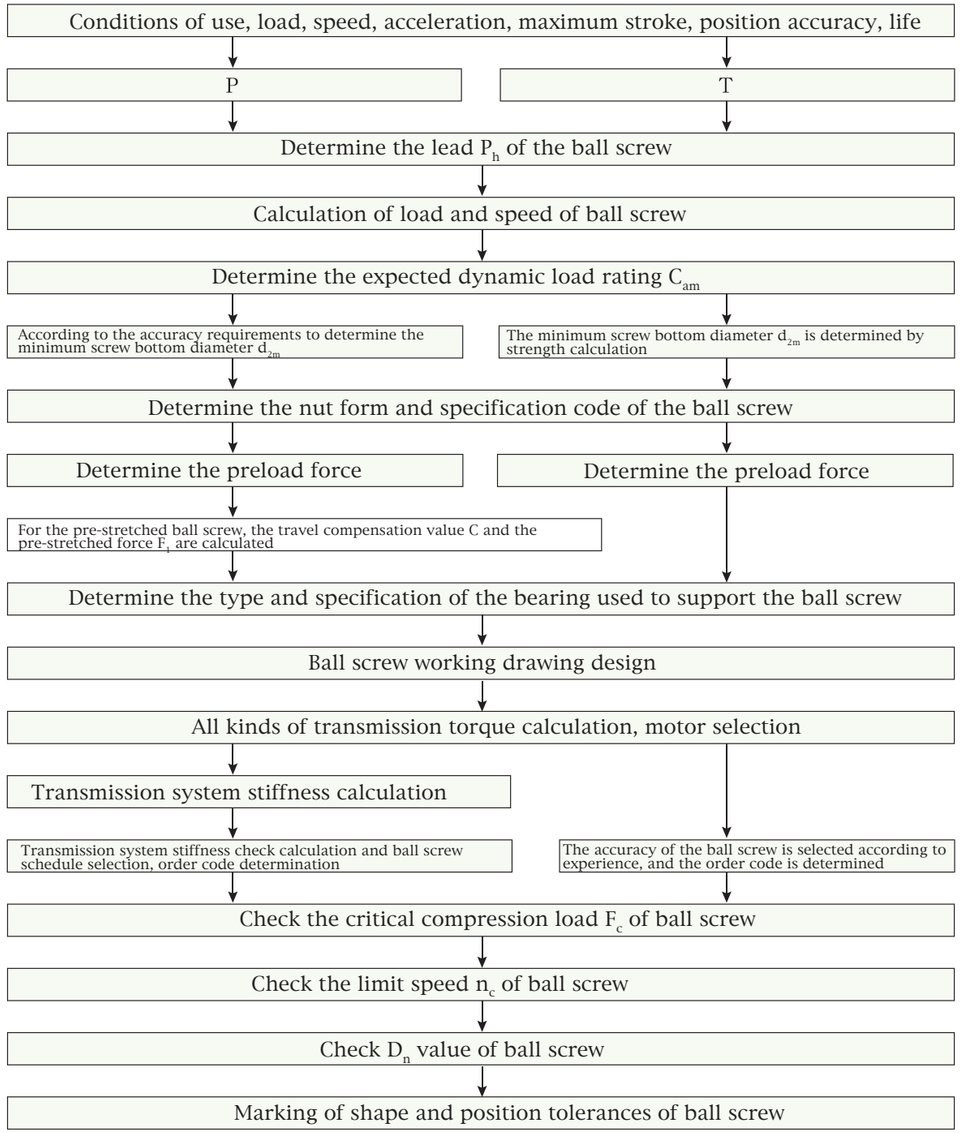
Purpose		NC Machine																			
		Lathe		milling and boring machine		machining center		drilling machine		jig boring machine		grinding machine		EDM machine		Wire cutting machine		punching machine	Laser processing machinery		Wood-working machinery
shaft		X	Z	XY	Z	XY	Z	XY	Z	XY	Z	XY	Z	XY	Z	XY	Z	XY	XY	Z	
accuracy level	P1	○		○		○				○	○	○	○	○		○	○				
	P2	○		○	○	○	○					○	○	○	○	○	○				
	P3	○	○	○	○	○	○	○				○	○	○	○	○	○	○	○	○	
	P4	○	○	○	○	○	○	○							○	○	○	○	○	○	
	P5	○	○	○	○			○	○								○	○	○	○	
	T7																				○
	T10																				○

Continuation Tab-7

Purpose		General machinery Special mechanical	semiconductor/printed board manufacturing						equipment Industrial robot					Metal-lurgical equip-ment machin-ery	Electric injection molding machine	Three-dimen-sional measur-ing in-strument	Rubber and plastic machinery	Precision class
			Exposure equip-ment	Chemical processing equipment	Lead welding machine	detector elec-tronic	parts insertion machine	Printing plate perfora-tor	Orthogonal coordi-nate form		Vertical polyarticu-lar type		Cylindri-cal co-ordinate type					
									assemble	other	assemble	other						
Preci-sion class	P1		○		○	○		○								○		○
	P2				○	○	○	○	○							○		
	P3	○		○			○	○	○		○		○					
	P4	○		○			○	○	○		○		○					
	P5	○		○			○	○	○	○	○	○	○		○		○	
	T7	○		○					○	○	○	○	○	○	○		○	
	T10	○		○						○				○	○		○	

Parameter calculation and selection of ball screw

Calculation steps and processes



1. To determine the lead P_h of ball screw

To determine the lead P_h by transmission diagram, max. working speed V_{max}, Max.speed of motor n_{max} and the ratio of transmission i

$$P_h = \frac{V_{max}}{i \cdot n_{max}}$$

When motor is connected with ball screw directly, i=1

$$P_h = \frac{V_{max}}{n_{max}}$$

The round-off process should be done with the calculated value P_h.

2. To calculate the load and speed of ball screw

● Min. load F_{min}

Transmission force of machine when without load,e.g. friction force caused by weight of the worktable.

● Max. load F_{max}

Transmission force of machine when with max.load, is equal to axial component of cutting force and guide friction (the guide friction resulted from machine weight, workpiece weight, fixture weight and vertical component of cutting)

● Equivalent speed nm and equivalent load F_m:

When speed is $n_1, n_2, n_3, \ldots n_n$, the ratio of working tie to total time is respectively $t_1\%, t_2\%, \ldots t_n\%$, the load is $F_1, F_2, \ldots F_n$ respectively

$$n_m = n_1\frac{t_1}{100} + n_2\frac{t_2}{100} + \cdots\cdots + n_n\frac{t_n}{100}$$

$$F_m = \sqrt[3]{\frac{F_1^3 n_1 \frac{t_1}{100} + F_2^3 n_2 \frac{t_2}{100} + \cdots\cdots + F_n^3 n_n \frac{t_n}{100}}{n_m}}$$

When the speed is approximately proportionate to the load and every speed is available distribute, make calculation according to the following formula:

$$n_m = \frac{n_{max} + n_{min}}{2}$$

$$F_m = \frac{2F_{max} + F_{min}}{3}$$

3.To determine the expected rated dynamic load

● To calculate on the basis of expected working time L_h (Unit: hour)

$$C_{am} = \sqrt[3]{60 n_m L_h} \cdot \frac{F_m f_w}{100 f_a f_c} \quad (N)$$

● To calculate on the basis of expected running distance L_s (Unit: km)

$$C_{am} = \sqrt[3]{\frac{L_s}{P_h}} \cdot \frac{F_m f_w}{f_a f_c} \quad (N)$$

In formula:

L_h~expected working time (Unit: hour)(see Tab-5)

L_s~expected working distance (Unit: Km), usually L_s is 250Km

f_a~accuracy coefficient. Select it according to accuracy grade which is firstly determined(see Tab-6).

f_c~reliability coefficient. Usually f_c=1. in important condition, a group of same ball screw is required that the rated service life should go beyond 90% under the same circumstance (see Tab-7)

F_w~load coefficient, selecting by load character (see Tab-8)

Tab-5 expected working time L_h of all kinds of machine

Machine type	L_h(hour)	Note
General machinery	5000~10000	L_h=250 (day) x 16 (hour) x 10 (year) x 0.5(running ratio)
General machine tool	10000~20000	
NC machine tool	20000	
Precision machine tool	20000	
Measuring machinery	15000	
Aviation machinery	1000	

Tab-6 Accuracy coefficient f_a

Accuracy grade	1.2.3	4.5	7	10
f_a	1.0	0.9	0.8	0.7

Tab-7 reliability coefficient f_c

Reliability %	90	95	96	97	98	99
f_c	1	0.62	0.53	0.44	0.33	0.21

Tab-8 load character coefficient f_w

Load character	without impact (Stable motion)	light impact	with impact or vibration
f_w	1~1.2	1.2~1.5	1.5~2

● As for ball screw with preload,Dynamic preload Cam can be calculated from the following formula:

$$C_{am} = f_e F_{max}$$

In formula:

f_e~preload coefficient (see Tab-9)

Tab-9 preload coefficient f_e

Preload type	light preload	medium preload	heavy preload
f_e	6.7	4.5	3.4

The bigger one of three calculation is the ultimate C_{am}

4. Determine min. thread bottom diameter d_{2m} according to accuracy requirements

● Estimate max. axial deformation δ_m roughly

In general case, the main factors affecting blind space listed below according to affecting degree:

a. drawing compression rigidity of bal screw K_s;

b. axial rigidity of supporting bearing K_b

c. contact rigidity between balls and rolling track K_c

d. servo system rigidity converted over ball screw K_R

e. coupling rigidity K_te. coupling rigidity K_t

f . twist rigidity of ball screw K_k

g. rigidity of nut seat, bearings seat K_h

Then,the rigidity of transmission system of ball screw can be calculated as following formula:

$$\frac{1}{K} = \frac{1}{K_s} + \frac{1}{K_b} + \frac{1}{K_c} + \frac{1}{K_R} + \frac{1}{K_t} + \frac{1}{K_k} + \frac{1}{K_h}$$

K_s, K_b, K_c is three important factors affecting value of rigidity. Generally, the below formula are used:

$$\frac{1}{K} = \frac{1}{K_s} + \frac{1}{K_b} + \frac{1}{K_c}$$

The rigidity of system is different when moving unit on mechanical equipment is in different position. The min. rigidity is remarked by K_{min}. When workload works in axial direction of ball screw, a elastic deformations comes into being, δ=F/K. accuracy of transmission system is especially affected by this deformation.

Usually,servo system precision of machine tool or machinery will be examined without load. At this time, max. axial workload on ball screw is static friction F_o. When moving units start or return, a tolerance $2F_o/K_{min}$ (i.e. blind friction error) is produced because moving direction changed. This is the main factor affecting positioning accuracy (usually is 1/2—2/3 accuracy of repetitive position) so, the max. permissible axial deformation is:

$$\delta_m = \frac{F_0}{K_{min}} \approx \left(\frac{1}{2} \sim \frac{2}{3}\right) \cdot \text{Accuracy of repetitive position}$$

The most important factor affecting positioning accuracy is the accuracy of ball screw. Next is drawing compression elastic deformation of ball screw (this deformation change according to different position of screw nut on ball screw), and others are friction torque and so on. Estimate it roughly by formula $\delta_m \leq$(1/4—1/5) positioning accuracy. δ_m(unit:μm) is the smaller value estimated in the above mentioned two methods.

● To estimate bottom diameter of ball screw d_{2m} roughly.

a. when mounting,one end of ball screw is fixed, the other is free (see Fig-2)

$$d_{2m} \geqslant 2 \times 10\sqrt{\frac{10F_0 L}{\pi \delta_m E}} = 0.078\sqrt{\frac{F_0 L}{\delta_m}}$$

In formula:

E—young's elastic modulus 2.1 x 10^5 N/mm^2

δ_m—estimated max. permissible axial deformation (μm)

F_o—static friction of guide (N) $F_o=\mu_o w$(μ_o is static friction coefficient)

L—max. distance from nut to fixed end (mm)

L≈travel distance + safety distance + remaining distance + half of nut length + half of supporting bearing length

≈travel distance + (2~4) P_h+ 4P_h + (4~6)P_h + (1/20~1/10) travel distance

≈(1.05~1.1) travel distance + (10~14)P_h

b. When mounting, both ends are fixed.(see Fig-3)

$$d_{2m} \geqslant 10\sqrt{\frac{10F_0 L}{\pi \delta_m E}} = 0.039\sqrt{\frac{F_0 L}{\delta_m}}$$

In formula:

L= distance between the fixed supporting bearings(mm)

L≈ travel distance + safety distance + two remaining distance + nut length + one supporting length

≈ (1.1~1.2) travel distance + (10~14) P_h

5. To determine the specification code of ball screw

Determine nut type(which is shown in catalogue)according to transmission model and working conditions. Refer to catalogue, find out suitable bottom diameter d_2 and rated dynamic load C_a. choose $d_2 \geq d_{2m}$, $C_a \geq C_{am}$ carefully and avoid overlarge value d_2 and C_a, otherwise dimension and moment of inertia will beyond value of proper ones. Then determine nominal diameter, recycling number, specification code of nut and relevant connecting dimension.

6. To determine preload F_p of ball screw with preload

As for selection of ball screw with preloaded nut type, preload F_p should be specified.

When max. axial load F_{max} is certain value,

$$F_p = \frac{1}{3} F_{max}$$

When it can't

$$F_p = \xi C_a$$

Value of C_a (rated dynamic load) can be found from catalogue, ξ can be selected from Tab-10

Tab-10

Preload type	light load	medium load	heavy load
ξ	0.05	0.075	0.1

7. To calculate the distance compensation C and pre-extension Ft

As for ball screw which needs pre-extension(see Fig-2), the distance compensation C for target value and the pre-extension force should be specified for both fixed end of ball screw.

$$C = \alpha \cdot \Delta t \cdot L_u = 11.8 \Delta t \cdot L_u 10^{-6}$$

In formula:

C—travel distance compensation(μm)

Δt—temperature variation. Generally is 2~5°C

α —coefficient of linear expansion of bal screw 11.8 x 10-6/°C

L_u—effective travel distance (mm)

L_u ≈travel distance of worktable + length for nut + two safety travel ≈travel distance + (8~14)P_h

$$F_t = \frac{\Delta IAE}{L} = \alpha \cdot \Delta t \frac{\pi d_2^2}{4} E = 1.95 \Delta t d_2^2$$

In formula:

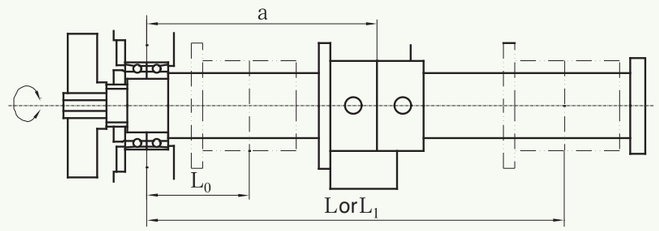
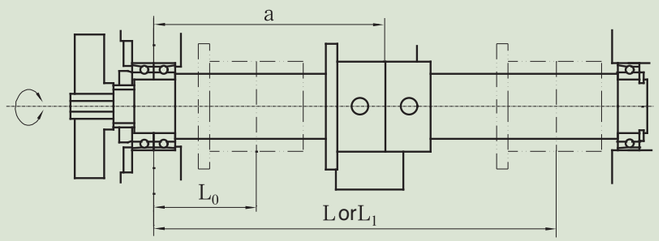
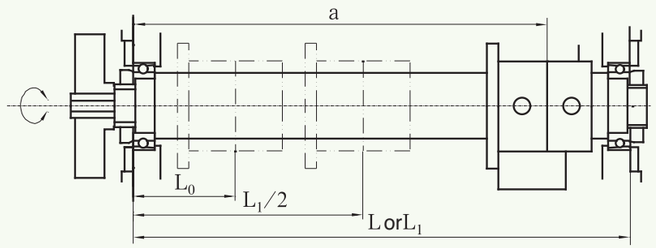
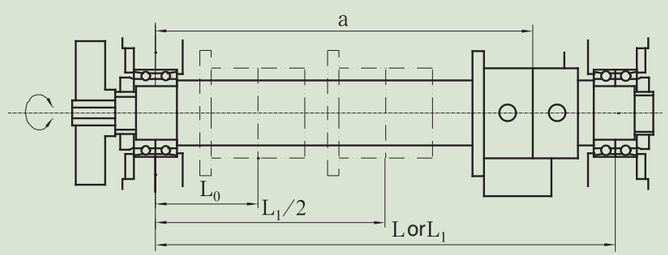
F_t—pre-extension force(N)

d_2—thread bottom diameter of ball screw(mm)

E—young's elastic modulus 2.1 x 10^5(N/mm^2)

Δt—temperature variation. Generally is 2~5°C

Fig-3

Supporting model	Diagram
One end fixed, One end free G--Z	
One end fixed One end movable G—Y	
Two ends supporting J---J	
Two ends fixed G—G	

8. To determine specifications code of bearing used for ball screw

- To calculate max. axial load F_{Bmax} over bearing; as for ball screw with pre-extension force, pre-extension force F_t should be considered.
- To select bearing model according to requirements for ball screw bearing.
- To determine inner diameter of bearing. Inner diameter of bearing is better equal to or smaller than outer diameter of ball screw. When choose innercycle type ball screw, inner diameter of bearing one end should be slightly smaller than bottom diameter of ball screw, value of pre-extension force should be larger than 1/3 of max. load, i.e. F_{Bmax}.
- Others checking items of bearings, see products catalogue.

9. Working drawing design of ball screw

- Thread length of ball screw $L_s = L_u + 2L_e$
  L_e is remaining travel distance (see P53 Tab-3)
  L_u is equal to travel distance and nut length
- Mounting and connecting dimension, see products catalogue.
- Nut should not support axial load and overturning moments. Axial resultant of forces working on nut should be made passing through the spindle core of ball screw.
- The cylindrical surface of nut and innerside surface of flange can be used as the standard surface, at the same time the holes of nut seat and bearing of ball screw will be concentric. The end surface will be vertical to spindle line of nut seat. When the load without big impact, we can only use the innerside surface of flange and fringe as the fixing standard surface, and the end surface of nut seat will be guaranteed to vertical to the guide. When assembling, be sure to keep cylindrical circle and the supporting bearing hole of screw concentric.
- When return-tube type ball screw is laid horizontally, tube will be put upside of ball screw of spindle line, in order that balls can circulate smoothly.
- To guarantee the rigidity of nut seat, bearing seat and fastening screw, when designing and design strengthen rib in direction of supports.
- To determine the length of ball screw according to working drawing.

10. Selection of motor

- To calculate kinds of torque working on ball screw

With additional load, Friction torque T_F(N.m) resulted is calculated from:

$$T_F = \frac{FP_h}{2\pi\eta} \times 10^{-3}$$

Preload torque T_p(N.m) resulted from preload F_p is calculated from:

$$T_p = \frac{F_pP_h}{2\pi} \cdot \frac{1-\eta^2}{\eta^2} \times 10^{-3}$$

In formula:
P_h—lead of ball screw
η—efficiency of unpreload ball screw
screw with accuracy grade 1.2.3 its n=0.9
screw with less accuracy than grade 4 its n=0.85
F—additional axial load wotked on ball screw, its value is different when in different circumstance. When calculating starting torque,if machine starts without load, F is guide friction; (as for vertical motion F also includes framework weight). If the machine is with full load, f is friction and max. working load, (as for vertical motion, F also includes framework weight). When calculating working torque of motor, F is guide friction and working load. (as for vertical motion, F also include the framework weight).

- To calculate the rotational moment of inertia with load J_L(kg.m^2) and moment of inertia of transmission system J(kg.m^2)

$$J_L = \Sigma J_i\left(\frac{n_i}{n_m}\right)^2 + \Sigma m_j\left(\frac{V_j}{2\pi n_m}\right)^2$$

$$J = J_m + J_L$$

In formula:
J_i, n_i—the moment of inertia(kg.m^2) and the speed (r/min) of every rotation elements
M_j, V_j—the mass (kg) and the speed(m/min) of every linear motion elements
J_m, n_m—the rotational moment of inertia(kg.m^2) and the speed(r/min) of motor

- Rotational acceleration Ta and max. acceleration torque T_{am}

When rotational speed of motor rises from speed n_1 to n_2:

$$T_a = J \cdot \frac{2\pi(n_1 - n_2)}{60t_a}$$

When rotational speed of motor is from zero to max. n_{max}:

$$T_{am} = J \cdot \frac{2\pi n_{max}}{60t_a}$$

In formula:
n—rotational speed of motor(r/min)
n_{max}—max. rotational speed of motor(r/min)
t_a—accelerating time(s)
t_a≈(3~4) tm or specified according to technical data required
t_m—motor time constant.(consult the motor catalogue)

- Max. starting torque of motor T_r (N.m)

$$T_r = T_{am} + (T_F + T_p + T_b + T_f)i + T_e$$

In formula:
i—transmission ratio of motor to ball screw, when directly connecting i=1
T_b, T_f are the torque generated by ball screw supports of both ends
T_e—friction torque caused by other transmission elements except balls screw converted to motor.

- Max. torque, when motor is in non-stop running operation

The torque of motor,when machine works in continuous and regular running state under max. working load T_M(N.m)

$$T_M = (T_F + T_p + T_b + T_f)i + T_e$$

- Three aspects need attentions, when selecting motor according to catalogue

a. matching inertia, chosen from the motor instruction.
b. check the value of max. torque of motor ≥ T_r
c. check the rated torque of motor≥T_M, and the continuous work area $T_M$of motor.

11. To calculate rigidity of transmission system

- To calculate rigidity K of transmission system

$$\frac{1}{K} = \frac{1}{K_s} + \frac{1}{K_b} + \frac{1}{K_c} + \frac{1}{K_R} + \frac{1}{K_d} + \frac{1}{K_t} + \frac{1}{K_h} + \frac{1}{K_\varnothing} \quad \text{(Formula 1)}$$

In formula:
K_s—extensional rigidity of ball screw. Calculation see follow explanation.
K_b—axial rigidity of ball screw supporting bearing. Consult concerned bearing catalogue for detailed data.

K_c—contact rigidity between balls and ball screw raceway. Consult catalogue concerned.

K_R—servo rigidity converted to ball screw,generally it is neglected. When exact value is required, it can be calculated by the formula:

$$K_R = K_R'(\frac{2\pi}{P_h})^2$$

and $K_R' = \frac{K_s K_t(1+K_{vo})}{K_m R_m}$ consult servo motor catalogue

K_d—rigidity of screw nut, usually neglected, when necessary, it can be calculated exactly from formula: $K_d \approx 4K_c$.

K_t—rigidity of shaft-joint converted to ball screw, usually neglected, it can be calculated exactly from formula when necessary

$$K_t = K_t'(\frac{2\pi}{P_h})^2$$

K_t' is the rigidity of shaft-joint introduced in this catalogue.

K_h—rigidity of nut seat, bearing seat, usually neglected, exactly calculated by the methods of limited elements.

K_ϕ—torsion rigidity of ball screw, usually neglected.

Usual calculation:

$$K = \frac{1}{K_s} + \frac{1}{K_b} + \frac{1}{K_c} \quad \text{(formula 2)}$$

● To calculate Ks(N/μm)

There is a functional relationship between extensional rigidity K_s and distance a between nut and fixed point of ball screw. see Fig-4

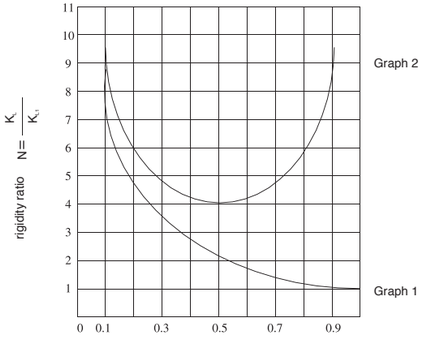


Fig-4 Extensional rigidity and travel distance

Travel distance ratio: $n=L/L_1$

Graph.1: one end is fixed, the other is free or movable.

Graph.2: both ends are fixed or two supporting bearings.

a. One end of support is fixed, the other is free.

$$K_S = \frac{\pi d_2^2 E}{4a} \times 10^{-3} = 1.65\frac{d_2^2}{a} \times 10^2$$

In formula:

K_s—extensional rigidity(N/mm²)

E—young's elastic moduls 2.1x10⁵(N/mm²)

d_2—bottom diameter of ball screw(mm)

When a =L_1 (max. distance between nut and fixed support, the rigidity is the min. one.(see page 61, Fig-3)

$$K_{s\,min} = 1.65\frac{d_2^2}{L_1} \times 10^2$$

When a=L_0 (nut is at the beginning point of travel), rigidity is the max. one. (see page 61, Fig-3)

$$K_{s\,max} = 1.65\frac{d_2^2}{L_0} \times 10^2$$

b. When both ends of support are fixed.

$$K_s = \frac{\pi d_2^2 E L_1}{4a(L_1 - a)} = 6.6\frac{d_2^2 L_1}{4a(L_1 - a)} \times 10^2$$

When a = L_1/2(nut is at the midpoint of both ends of supporting bearing), rigidity is the min. one.(see page 61, Fig-3)

$$K_{s\,min} = 6.6\frac{d_2^2}{L_1} \times 10^2$$

In formula:

L_1—distance between two supporting bearings (see page 61, Fig-3)

When a=L_0 (nut is at either end of the travel), rigidity is the max. one.(see page 61, Fig-3)

$$K_{s\,max} = 6.6\frac{d_2^2 L_1}{4L_0(L_1 - L_0)} \times 10^2$$

● To calculate K_b(N/μm)

a. The rigidity K_B of unpreload bearing and the combined rigidity K_{B0} of a pair of preload bearings can be found from catalogue or approximately calculated from the formulas shown in Tab-11.

Tab-11 to calculate K_B and K_{B0}

Bearings model	K_B(N/μm)	K_{B0}(N/μm)
Angle contact ball bearing (6000T)	$2.34\sqrt[3]{d_Q Z^2 F_a \sin^5\beta}$	$2\times 2.34\sqrt[3]{d_Q Z^2 F_{a\,max} \sin^5\beta}$
Thrust ball bearing (8000T)	$1.95\sqrt[3]{d_Q Z^2 F_a}$	$2\times 1.95\sqrt[3]{d_Q Z^2 F_{a\,max}}$
Conical roller bearing (7000T)	$7.8\sin^{1.9}\beta\, L_r^{0.8} Z^{0.9} F_a^{0.1}$	$2\times 7.8\sin^{1.9}\beta\, L_r^{0.8} Z^{0.9} F_{a\,max}^{0.1}$
Thrust cylindrical roller bearing (9000T)	$7.8 L_r^{0.8} Z^{0.9} F_a^{0.1}$	$2\times 7.8 L_r^{0.8} Z^{0.9} F_{a\,max}^{0.1}$

Notes:

(1) The condition of using the formula in the table:

Preload of ball bearing:

$$F_p = \frac{1}{2\sqrt{2}} F_{a\,max} \approx \frac{1}{3} F_{a\,max}$$

Preload of roller bearing:

$$F_p \approx \frac{1}{2} \times F_{a\,max}$$

(2) in the table:

β—bearing contact angle (deg)

d_Q—rolling body diameter (mm)

L_r—roller effective length (mm)

Z—number of rolling body

F_a—axial working load(N)

F_{amax}—max. axial working load(N)

b. Supporting bearing rigidity K_b of ball screw (see Tab-12 and page 61 & Fig-3)

Tab-12 To calculate K_b

One end fixed, one end free	$K_b = K_{BO}$
Two ends support	preload $K_b = K_{BO}$ unpreload $K_b = K_B$
One end fixed, one end movable	fixed end with preload $K_b = K_{BO}$
Two ends fixed	fixed end with preload $K_b = 2K_{BO}$

● To calculate K_c

a. As for unpreload ball screw, the axial working load is F(N):

$$K_c = K_c'(\frac{F}{0.3C_a})^{\frac{1}{3}}$$

In formula:

K_c'—rigidity shown in catalogue(N/μm)

C_a—rated dynamic load

b. As for preload ball screw, the axial preload F_p(N)

$$K_c = K_c'(\frac{F_p}{0.1C_a})^{\frac{1}{3}}$$

In formula: the definition of K_c' and C_a are the same as above

12. Check the rigidity of transmission system and accuracy selection of ball screw

Substitute K_{smax}, K_b, K_c and other relevant values into formula 1 of page 62 and formula 2 of page 63, then get K_{max}.

Substitute K_{smin}, instead of K_{smax} into the formula, then value of K_{min}.

Since CNC machine tool's accuracy is tested under conditions without load, $\Delta = 2F_o/K_{min}$ is described as blind friction error.

F_o is the static friction of guide when machine is idly running.

$$\delta_k = F_0(\frac{1}{K_{min}} - \frac{1}{K_{max}})$$

is the positioning deviation caused by the variation of transmission system rigidity. According to JB/GQ1140-89, CNC machine tool reverse disparity mainly depends on Δ, and positioning deviation mainly depends on the accuracy of ball screw, next depends on δ_k.

● Check the rigidity of transmission system

$0.8\Delta \le$reverse disparity i.e. $K_{min} \ge 1.6F_o$/reverse disparity

● Accuracy selection of ball screw

Ball screw used in open-loop control system:

$e_p + V_{up} \le 0.8x$ (positioning accuracy- δ_k)

$e_p + V_{300p} \le 0.8x$ (positioning accuracy/ 300mm- δ_k)

Semi-closed loop control system or open-loop control system with compensable travel distance:

$e_p \le 0.8x$ (positioning accuracy- δ_k)

$V_{300p} \le 0.8x$ (positioning accuracy/ 300mm- δ_k)

At first, select the type of ball screw according to using conditions(P type or T type), then refer to the accuracy standard table.(see P52, Tab-2)

Determine e_p, V_{up} or V_{300p} of ball screw according to the calculating results, then determine its accuracy grade.

13. Check and verify the critical compressed load Fc of ball screw(verify the stediness of compression lever)

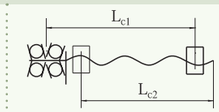
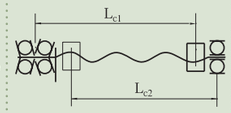
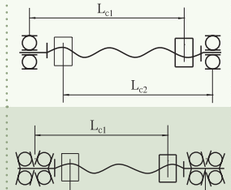
$$F_c = K_1 K_2 \frac{d_2^4}{L_{c1}^2} \times 10^5 \geqslant F'_{max}$$

In formula:

d_2—screw thread bottom diameter of ball screw, see catalogue(mm).

L_{c1}—max.pressed length of bal screw(mm). (see Tab-13)

Tab-13

Supporting model	diagram	K_2	λ	f
One end fixed One end free		0.25	1.875	3.4
One end fixed One end movable		2	3.927	15.1
Two ends support		1	3.142	9.7
Two ends fixed		4	4.730	21.9

F'_{max}—max. axial compressed load of ball screw. If the max. load is not compressed, F'_{max} is not equal to F_{max}. Calculate F'max value depends on working conditions.

K_1—safety coefficient. Ball screw vertically installed, K_1=1/2

Ball screw horizontally installed K_1=1/3

K_2—supporting coefficient. It is relevant to supporting model.(see Tab-13)

14. Check and verify limit rotating speed n_c of ball screw (avoiding resonance when rotating at high speed)

$$n_c = K_1 \frac{60\lambda^2}{2\pi L_{c2}^2}\sqrt{\frac{EI}{PA}} = f\frac{d_2}{L_{c2}^2} \times 10^7$$

In formula:

n_c—limit rotating speed(r/min)

L_{c2}—length for critical rotating calculated speed (see Tab-14)

E—young's modulus 2.1x10⁵(N/mm²)

ρ—density of material, density of steel material is

$$\frac{7.8\times10^{-5}\,N/mm^3}{9.8\times10^3\,mm/s^2}$$

I—min. moment of inertia of ball screw

$$I = \frac{\pi}{64} d_2^4 (mm^4)$$

A—min. transverse section area of ball screw

$$\frac{1}{4}\pi d_2^2(mm^2)$$

K_1—safety coefficient, generally K_1=0.8
F, λ —coefficient related to supporting model (see P64, Tab-13)

15. Check and verify value of D_n

$$D_{PW} \cdot n_{max} \le 100000$$

In formula:
D_{pw}---diameter of pitch circle of bal screw(mm) $D_{pw} \approx d_2 + D_w$(mm)
N_{max}---max. rotating speed of ball screw

16. Form and position tolerance size marking of ball screw, see Fig-2 P53 and Tab-4 P54

Some transmission type ball screw (such as T type), with low accuracy requirement, but its transmitted load is very large. At that time, the calculation of transmission accuracy and rigidity of the transmission system can be omitted, but the following two is required to be calculated.

17. Check and verify value of basic axial rated static load C_{oa}

$$f_s F_{a\,max} \le C_{oa}$$

In formula:
C_{oa}—basic rated static load of ball screw(N), consult this catalogue
f_s—static safety coefficient f_s=1~2 for common load f_s=2~3 for load with impact and vibration
F_{amax}—max. axial load(N)

18. Check and verify calculation of intensity

$$[\sigma] \cdot \frac{1}{4}\pi d_2^2 \geqslant F_{a\,max} \qquad d_2 \geqslant \sqrt{\frac{4F_{a\,max}}{\pi[\sigma]}}$$

$[\sigma]$---permissible stress(N/mm^2)
d_2---thread bottom diameter of ball screw, consult catalogue

Calculation example:

Design calculating of ball screw used for feeding worktable of a machine center:
Given that: weight of worktable W_1=5000N
Max. weight of workpiece and fixture W_2=3000N
Max. length of worktable L_k=1000mm
Friction coefficient of worktable's guide: dynamic friction coefficient μ=0.1 Static friction coefficient 7 μ_0=0.2 Rapid federate: V_{max}=15m/mim
Positioning accuracy: 20μm/300mm
Repeat positioning accuracy:10μm for total travel distance:25μm
Demanded service life:2000hours(2 shifts working,10 years in operation)
For other working conditions, see Tab-14

Tab-14

Cutting type	longitudinal cutting force P_{xi}(N)	vertical cutting force P_{zi}(N)	Feed speed V_i(m/min)	Working time t%	Axial load over ball screw (N)	Speed of ball screw (r/min)
High force cutting	2000	1200	0.6	10	2920	60
Common cutting	1000	500	0.8	30	1850	80
Precisely cutting	500	200	1	50	1320	100
Rapid feed	0	0	15	10	800	1500

1) To determine the lead Ph of ball screw

$$P_h = \frac{V_{max}}{i \cdot n_{max}}$$

P_h: Lead of ball screw (mm)
V_{max}: max. working speed m/min
n_{max}: Max. speed of motor r/min
i: ratio of transmission
i=1, when motor is connected with ball screw directly
To find in Tab-14:
V_{max}=15m/min
n_{max}=1500r/min
replace and gotten
P_h=10mm
Take
P_h=10mm

2) To determine equivalent speed and equivalent load

- In condition of all kinds of cutting ways, speed of ball screw is:

$$n_i = \frac{V_i}{P_h} \times 10^3$$

n_i: speed of ball screw r/min i=1,2,Λ,n
V_i: feed speed m/min i=1,2,Λ,n
To find in Tab-14
V_1=0.6, V_2=0.8, V_3=1, V_4=15
Replace and gotten
n_1=60, n_2=80, n_3=100, n_4=1500

- In condition of all kinds of cutting ways, axial load of ball screw

$$F_i = P_{xi} + \mu \cdot (W_1 + W_2 + P_{zi})$$

F_i: axial load of ball screw	N	i=1,2,Λ,n
P_{xi}: longitudinal cutting force	N	i=1,2,Λ,n
P_{zi}: vertical cutting force	N	i=1,2,Λ,n

To find in Tab-14
P_{x1}=2000N, P_{x2}=1000N, P_{x3}=500N,P_{x4}=0N
P_{z1}=1200N, P_{z2}=500N, P_{z3}=200N, P_{z4}=0N
Given: W_1=5000N, W_2=3000N
Replaced and gotten
F_1=2920N, F_2=1850N, F_3=1320N, F_4=800N

- Equivalent speed

$$n_m = n_1\frac{t_1}{100} + n_2\frac{t_2}{100} + \Lambda + n_n\frac{t_n}{100}$$

n_m: equivalent r/min
t_1,t_2, Λ ,t_n: percent of working time
To find in Tab-14
t_1=10, t_2=30, t_3=50, t_4=10
Replaced and gotten
n_m=230r/min

- Equivalent load

$$F_m = \sqrt[3]{F_1^3\frac{n_1t_1}{n_m100} + F_2^3\frac{n_2t_2}{n_m100} + \Lambda + F_n^3\frac{n_nt_n}{n_m100}}$$

F_m: equivalent load N
Replaced and gotten
F_m=1290N

3) The expected rated dynamic load

- To calculate on the basis of expected working time

$$C_{am} = \sqrt[3]{60n_mL_h}\,\frac{F_mf_w}{100f_af_c}$$

C_{am}: the expected rated dynamic load N
To find in Tab-8: f_w=1.3 with light impact
To find in Tab-6: f_a=1 on basis 1~3 items
To find in Tab-7: f_c=0.44 if reliability 97%
Given: L_h=20000hours
Replaced and gotten
C_{am}=24815N

- To calculate according to max. load F_{max}, if the preloaded ball screw will be used

$C_{am}=f_eF_{max}$
To find in Tab-9: f_e=4.5 with middle preload.
Replaced and gotten
C_{am}=13140N
To adopt the biggest value of above two results
C_{am}=24815N

4) To determine permissible min. thread bottom diameter

- To estimate max. permissible axial deformation of ball screw

① $\delta_m \le$(1/3~1/4) repeat positioning accuracy
② $\delta_m \le$(1/4~1/5) positioning accuracy
δm: max. axial deformation μm
Given: repeat positioning accuracy is 10μm, positioning accuracy is 25μm
① δ_m=3
② δ_m=6
To adopt the smaller value of two results δ_m=3μm

- To estimate min. thread bottom diameter

Take both ends fixed supporting if ball screw requires pre-extension

$$d_{2m} = 10\sqrt{\frac{10F_0L}{\pi\delta_mE}} = 0.039\sqrt{\frac{F_0L}{\delta_m}}$$

d_{2m}: min. thread bottom diameter mm
L≈(1.1~1.2) travel + (10~14)P_h
Static friction $F_o=\mu_0W_1$
Given: travel is 1000mm, W_1=5000N, μ_0=0.2
Replaced and gotten
L=1320mm
F_0=1000N
d_{2m}=25.9mm

5) To determine specification and code of ball screw

- Innercycle float flange type, with cylinder double nuts combined spacer preload type is selected.
- To determine related type & specifications of ball screw referring to catalogue in accordance with the calculating results of P_h,C_{am},d_{2m}

FFZD4010-3
P_h=10
C_a=30000>C_{am}=24815
d_2=34.3>d_{2m}=25.9

6) To determine preload of ball screw

$$F_p = \frac{1}{3}F_{max}$$

Thereinto F_{max}=2920N
F_p≈1000N

7) Travel distance compensation value and extensional force

- Travel distance compensation value

$$C = 11.8\Delta tL_u \times 10^{-6}$$

In formula:
$L_u=L_K+L_n+2L_a$
L_K=1000
L_n=146 (L_1 in catalog)
L_k=(2~4) P_h=30
L_u≈1210mm
Δt difference in temperature is 2.5℃
C≈36μm

- Pre-extension

$$F_t = 1.95\Delta td_2^2$$

Replaced and gotten
F_t≈5735N

8) To determine bearing type and specification of ball screw

- Max. axial load over bearing

$F_{Bmax}=F_t+F_{max}$
Replaced and gotten
F_{Bmax}=7727N

- Bearing type

Both ends fixed supporting model, back to back angle-tough thrust ball bearing (touch angle)60°

● Inner diameter of bearing

d is little smaller than d_2=34.3 $F_{BP}=1/3F_{Bmax}$
d=30mm
Replace and gotten
F_{BP}=2575N

● Preload force of bearing

Preload ≥ F_{BP}

● Choose type & specification referring to catalogue

Preload ≥ F_{BP}, if d=30mm
Therefore to select bearing 7602030TVP
d=30mm
preload is
2900>F_{BP}=2575N

9) Designing working drawings of ball screw

● Thread length of ball screw L_s

$L_s=L_u+2L_e$ After finding from Tab-3, the excess distance L_e=40
Designing working drawing

● Distance between two fixed supports L_1

Finding this catalogue for mounting and specification dimension of nut
Total length of ball screw L

● Distance between starting point of travel with fixed support L_o

Gotten rom the working drawing
L_s=1290
L_1=1350
L=1410
L_o≈130

10) Selection of motor (omitted)

11) Rigidity o ftransmission system

● Extensional rigidity of ball screw

◆ Min. value of extensional rigidity

$$K_{s\,min}=6.6\frac{d_2^{\,2}}{L_1}\times 10^2$$

K_{smin}: min. value of extensional rigidity N/μm
d_2:bottom diameter
L_1=distance of fixed supporting
K_{smin}=575N/m

◆ Max. value of extensional rigidity

$$K_{s\,max}=6.6\frac{d_2^{\,2}L_1}{4L_0(L_1-L_0)}\times 10^2$$

K_{smax}: max. value of extensional rigidity N/μm
K_{smax}=1652 N/μm

● Combined rigidity of support bearing

◆ Combined rigidity of a pair of preload bearing

$$K_{BO}=2\times 2.34\sqrt[3]{d_Q Z^2 F_{a\,max}\,Sin^5\beta}$$

K_{Bo}: combined rigidity of a pair of preload bearing N/μm
d_Q: diameter of ball mm
Z: number of ball
F_{amax}: max. axial work load N
β : contact angle of bearing
Check 7602030 TUP bearing from the relative bearing catalogue F_{amax} is equal to 3 times of preload
d_Q=7.144 Z=17 β=60°
F_{amax}=8700 N/μm
K_{Bo}=964 N/μm

◆ Combined rigidity of support bearing

According to Table-16 fixed support on both ends
$K_b=2\,K_{BO}$
K_b=1932N/μm
K_b: combined rigidity of support bearing N/μm

◆ Contact rigidity of ball and raceway of ball screw

$$K_c'=K_c\left(\frac{F_p}{0.1C_a}\right)^{\frac{1}{3}}$$

K_c: contact rigidity of ball and raceway N/μm
K_c': Finding rigidity from catalogue N/μm
F_p: Preload of ball screw N
C_a: rated dynamic load N
Finding from catalogue
K_C' =973 N/μm; Ca=30000 N;
F_P=1000 N
K_C=1453 N/μm

12) Verifying rigidity and selecting of accuracy

$$\frac{1}{K_{min}}=\frac{1}{K_{s\,min}}+\frac{1}{K_b}+\frac{1}{K_c}$$

$$\frac{1}{K_{min}}=\frac{1}{339}\,N/\mu m$$

$$\frac{1}{K_{max}}=\frac{1}{K_{s\,max}}+\frac{1}{K_b}+\frac{1}{K_c}$$

$$\frac{1}{K_{max}}=\frac{1}{552}\,N/\mu m$$

$F_0=\mu_0 W_1$
Given W_1=5000N,μ_0=0.2
F_0=1000N
F_0: static friction N
U_0: static friction coefficient
W_1= positive pressure N

● Checking rigidity of transmission system

$$K_{min}=\frac{1.6F_0}{\text{reverse difference value}}$$

K_{min}: rigidity of transmission system N/μm
Given: reverse difference value or repeat positioning accuracy is 10μm
K_{min}=339>160

● Positioning error caused by variation of transmission rigidity

$$=F_0\left(\frac{1}{K_{min}}-\frac{1}{K_{max}}\right)$$

$$=1.14\,\mu m$$

● Ascertain accuracy grade

V_{300p}:travel variation over any thread length 300mm for semi-closed loop system,
V_{300p}≤ 0.8Xpositioning accuracy- δ_K
Positioning accuracy is 20μm/300
V_{300p}<14.86μm
The accuracy of ball screw is grade 3
V_{300p}=12μm<14.86μm

● Determine code & specification of ball screw

Determined type: FFZD
Nominal diameter: 40 lead: 10
Thread length: 1290
Total length of ball screw: 1410
P type accuracy grade 3
FFZD4010-3-P$_3$/1410 X 1290

13) Check and verify critical compression load

F_c : N
It is unnecessary to verify again because max. axial load F_{max} over ball screw is less than pre-extension force F.

14) Check and verify critical rotating speed

$$n_C=f\frac{d_2}{L_{C2}^{\,2}}\times 10^7$$

n_c: critical rotating speed
f: coefficient refer to support type
d_2: bottom diameter of ball screw
L_{c2}: calculating length according to critical rotating speed
f=21.9 from Tab-13
d_2=34.3 from catalogue
$L_{c2}=L_1-L_o$ from working drawing and Tab-13
n_c=5046>n_{max}=1500

15) Verification

$D_n=D_{pw}\cdot n_{max}$
D_{pw}: round diameter of ball screw mm
n_{max}: max. speed of ball screw n/min
D_{pw}≈41.4mm
n_{max}=1500r/min
D_n=62100<70000

16) Form and position tolerance dimension mark of ball screw(omitted)

Safe use of ball screw

1. Lubrication

In order to make use of function of ball screw, ball screw must be lubricated in working condition. There are following lubrication methods:

● Lubrication grease

The quantity of lubrication grease is generally 1/3 of inner space of nut. Before the ball screw leaves factory, Lithium lubrication grease GB7324-94 2# has been brought into inner space of nut.

● Lubrication oil

The quantity standard of lubrication oil is shown as tab.15. But it is changeable as difference of travel, type of lubrication, use condition (heat control). Please pay attention.

Tab-15 the quantity standard of lubrication oil (3 minutes' interval)

Shaft neck (mm)	Quantity(cc)
ø4~ø8	0.03
ø10~ø14	0.05
ø15~ø18	0.07
ø20~ø25	0.10
ø28~ø32	0.15
ø36~ø40	0.25
ø45~ø50	0.30
ø55~ø63	0.40
ø70~ø100	0.50
ø100~ø160	0.60

2. Dust-proof protection

Ball screw is as like as rolling bearing. If pollutant and strange thing comes into nut, ball screw will be worn soon. It is the reason to damage. So under consideration of pollutant and strange thing, the dust-proof protection unit (shield and lag) must be used. Ball screw will be protected completely.

In addition, if there is no strange thing, but there is floating dust, the wiper seals may be installed on the two ends of ball screw. Users select suitable specification in the light of code rule according to requirements.

3. Use

Please pay attention to following points to use ball screw:

- Nut should work in the available travel. If it is necessary, limit unit must be installed on the two ends of travel in order to avoid that the ball fall when nut goes over-travel. If the nut deviates screw or ball falls, please have a contact with us.
- Because of high transmission efficiency, ball screw could not keep self-hold. When used to drive in vertical direction reverse transmission as a result of dead weight after the motion stops or motor is out of electricity should be prevented. There are many mechanisms to prevent reverse transmission such as worm wheel and arbor, Hydraulic braker, electromagnetic braker and overrunning coupler as well. If overrunning coupler is to need, we can design and manufacture for customer.

4. Installation

● By installation of ball screw, pay attention to following points:

Ball screw is only used to take the axial load. Radial force and torque let ball screw have a bad load such as surface contact force. It will damage the ball screw forever. Therefore, if ball screw is mounted in machine tools, note:

◆ The axial line of ball screw must be parallel with axial line of linear motion guide. The three points of bearing seat of two ends for machine tools and nut seat must be in same line.

◆ If nut is mounted, nut is so near to supporting bearing as soon as possible.

◆ When installed the supporting bearings, close to the nut fixing part as possible.

● By installation ball screw into machine tools, do not uninstall the nut from ball screw. If necessary, help unit must be used. Otherwise ball screw will fall by installation. By installation nut, pay attention to following points:

◆ The outer diameter of help unit is smaller bottom diameter 0.1—0.2mm.

◆ The help unit must be near thread shoulder of ball screw.

◆ Do not pay too much power to avoid damage nut by installation.

◆ Avoid impact and be eccentric when setting installation hole.

DKF high speed precision ball screw

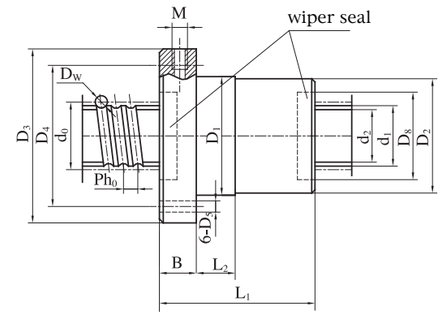
Unit: mm

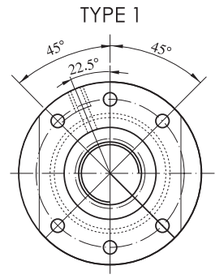
Note:

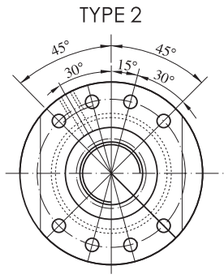
1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;
2) When the axial load F is not equal to 0.3Ca, Kc is the stiffness value in the table;

$$K_C = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

3) This type of ball screw pair is suitable for high-speed applications;
4) Normal working ambient temperature range ±80℃;
5) Any special request should be made at the time of ordering.







Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	D2($^{-0.1}_{-0.2}$)	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKF2010-3	20	10	20	3.175	17.3	3	10.8	19.6	269	36	36	15	58	11	47	6.6		22	44	M6	47	DKF2010-3
DKF2510-3	25	10	25	3.969	21.7	3	15.7	29.3	318	45	45	20	65	11	54	6.6		25.5	51	M6	50	DKF2510-3
DKF2510-4	25	10	25	3.969	21.7	4	20.5	39.9	428	45	45	20	65	11	54	6.6		25.5	51	M6	60	DKF2510-4
DKF2516-3	25	16	25	3.969	21.7	3	15.5	28.9	317	45	45	20	65	11	54	6.6		25.5	51	M6	71	DKF2516-3
DKF2516-4	25	16	25	3.969	21.7	4	20.2	39.4	427	45	45	20	65	11	54	6.6		25.5	51	M6	87	DKF2516-4
DKF2520-3	25	20	25	3.969	21.7	3	15.7	30.0	326	45	45	20	65	11	54	6.6		25.5	51	M6	80	DKF2520-3
DKF2816-4	28	16	28	3.969	24.7	4	21.8	45.8	481	50	50	20	80	11	65	6.6		31	62	M6	86	DKF2816-4
DKF3206-4	32	6	32	3.969	28.7	4	23.4	52.8	504	53	53	20	87	12	72	9		34.5	69	M6	46	DKF3206-4
DKF3206-5	32	6	32	3.969	28.7	5	28.7	66.9	633	53	53	20	87	12	72	9	1	34.5	69	M6	52	DKF3206-5
DKF3210-4	32	10	32	3.969	28.7	4	23.3	52.7	525	53	53	20	87	12	72	9		34.5	69	M6	63	DKF3210-4
DKF3210-5	32	10	32	3.969	28.7	5	28.6	66.7	658	53	53	20	87	12	72	9		34.5	69	M6	73	DKF3210-5
DKF3210-4	32	10	32	6.35	26.9	4	42.7	80.7	547	62	62	20	92	14	77	9		37	74	M6	67	DKF3210-4
DKF3210-5	32	10	32	6.35	26.9	5	52.3	102.3	686	62	62	20	92	14	77	9		37	74	M6	77	DKF3210-5
DKF3212-4	32	12	32	3.969	28.7	4	23.3	52.6	529	53	53	20	87	12	72	9		34.5	69	M6	68	DKF3212-4
DKF3212-5	32	12	32	3.969	28.7	5	28.5	66.6	663	53	53	20	87	12	72	9		34.5	69	M6	80	DKF3212-5
DKF3212-4	32	12	32	6.35	26.9	4	42.6	80.6	551	62	62	20	92	14	77	9		37	74	M6	75	DKF3212-4
DKF3212-5	32	12	32	6.35	26.9	5	52.2	102.1	690	62	62	20	92	14	77	9		37	74	M6	87	DKF3212-5
DKF3216-4	32	16	32	6.35	26.9	4	42.3	80.2	553	62	62	20	92	14	77	9		37	74	M6	92	DKF3216-4
DKF3220-3	32	20	32	3.969	28.7	3	17.5	38.1	394	53	53	20	87	12	72	9		34.5	69	M6	81	DKF3220-3
DKF3616-5	36	16	36	6.35	30.9	5	55.4	115.4	764	66	66	20	96	14	81	9		36.5	73	M8×1	106	DKF3616-5
DKF4010-4	40	10	40	6.35	34.9	4	48.0	102.6	648	70	70	20	100	14	85	9		37.5	75	M8×1	72	DKF4010-4
DKF4010-5	40	10	40	6.35	34.9	5	58.9	130.0	813	70	70	20	100	14	85	9		37.5	75	M8×1	82	DKF4010-5
DKF4012-4	40	12	40	6.35	34.9	4	47.9	102.5	656	70	70	20	100	14	85	9		37.5	75	M8×1	76	DKF4012-4
DKF4012-5	40	12	40	6.35	34.9	5	58.8	129.8	822	70	70	20	100	14	85	9		37.5	75	M8×1	88	DKF4012-5
DKF4015-5	40	15	40	6.35	34.9	5	58.6	129.5	830	70	70	20	100	14	85	9		37.5	75	M8×1	108	DKF4015-5
DKF4016-4	40	16	40	6.35	34.9	4	47.7	102.1	663	70	70	20	100	14	85	9	2	37.5	75	M8×1	91	DKF4016-4
DKF4016-5	40	16	40	6.35	34.9	5	58.5	129.4	831	70	70	20	100	14	85	9		37.5	75	M8×1	107	DKF4016-5
DKF4020-4	40	20	40	6.35	34.9	4	47.5	101.7	665	70	70	20	100	14	85	9		37.5	75	M8×1	110	DKF4020-4
DKF4020-5	40	20	40	6.35	34.9	5	58.2	128.8	833	70	70	20	100	14	85	9		37.5	75	M8×1	130	DKF4020-5
DKF4025-4	40	25	40	6.35	34.9	4	47.1	101.0	662	70	70	20	100	14	85	9		37.5	75	M8×1	127	DKF4025-4
DKF4030-3	40	30	40	6.35	34.9	3	36.8	77.1	508	70	70	20	100	14	85	9		37.5	75	M8×1	117	DKF4030-3

DKF high speed precision ball screw

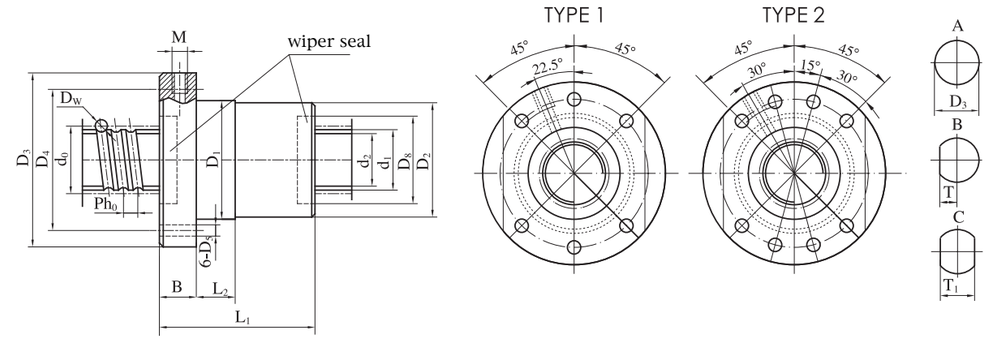
Unit: mm

Note:

1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;
2) When the axial load F is not equal to 0.3Ca, Kc is the stiffness value in the table;

$$K_C = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

3) This type of ball screw pair is suitable for high-speed applications;
4) Normal working ambient temperature range ±80℃;
5) Any special request should be made at the time of ordering.



Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D2(^{-0.1}_{-0.2})$	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKF5010-4	50	10	50	6.35	44.9	4	53.4	129.9	763	82	82	20	118	16	100	11		46	92	M8×1	70	DKF5010-4
DKF5010-5	50	10	50	6.35	44.9	5	65.4	164.5	957	82	82	20	118	16	100	11		46	92	M8×1	80	DKF5010-5
DKF5012-4	50	12	50	6.35	44.9	4	53.3	129.8	775	82	82	20	118	16	100	11		46	92	M8×1	79	DKF5012-4
DKF5012-5	50	12	50	6.35	44.9	5	65.4	164.4	972	82	82	20	118	16	100	11		46	92	M8×1	91	DKF5012-5
DKF5016-4	50	16	50	6.35	44.9	4	53.2	129.5	789	82	82	20	118	16	100	11		46	92	M8×1	91	DKF5016-4
DKF5016-5	50	16	50	6.35	44.9	5	65.2	164.0	990	82	82	20	118	16	100	11		46	92	M8×1	107	DKF5016-5
DKF5020-4	50	20	50	6.35	44.9	4	53.0	129.1	796	82	82	20	118	16	100	11		46	92	M8×1	105	DKF5020-4
DKF5020-5	50	20	50	6.35	44.9	5	65.0	163.6	998	82	82	20	118	16	100	11		46	92	M8×1	125	DKF5020-5
DKF5025-4	50	25	50	6.35	44.9	4	52.7	128.6	798	82	82	20	118	16	100	11		46	92	M8×1	129	DKF5025-4
DKF5030-4	50	30	50	6.35	44.9	4	52.3	127.9	795	82	82	20	118	16	100	11		46	92	M8×1	145	DKF5030-4
DKF5040-3	50	40	50	6.35	44.9	3	40.4	96.2	601	82	82	20	118	16	100	11		46	92	M8×1	145	DKF5040-3
DKF6310-5	63	10	63	6.35	57.9	5	71.7	206.1	1101	95	95	20	135	22	115	13.5		50	100	M8×1	80	DKF6310-5
DKF6312-5	63	12	63	6.35	57.9	5	71.6	206.0	1125	95	95	20	135	22	115	13.5		50	100	M8×1	91	DKF6312-5
DKF6312-5	63	12	63	7.938	56.7	5	97.6	257.2	1162	98	98	20	138	25	118	13.5		51.5	103	M8×1	94	DKF6312-5
DKF6316-5	63	16	63	6.35	57.9	5	71.5	205.7	1155	95	95	20	135	22	115	13.5		50	100	M8×1	107	DKF6316-5
DKF6316-5	63	16	63	9.525	55.6	5	125.0	307.9	1237	107	107	30	147	28	127	13.5	2	56	112	M8×1	122	DKF6316-5
DKF6320-5	63	20	63	6.35	57.9	5	72.9	212.0	1203	95	95	20	135	22	115	13.5		50	100	M8×1	127	DKF6320-5
DKF6320-5	63	20	63	9.525	55.6	5	124.7	307.3	1253	107	107	30	147	28	127	13.5		56	112	M8×1	140	DKF6320-5
DKF6325-4	63	25	63	6.35	57.9	4	59.3	166.9	968	95	95	20	135	22	115	13.5		50	100	M8×1	128.75	DKF6325-4
DKF6325-4	63	25	63	9.525	55.6	4	101.4	242.0	1008	107	107	30	147	28	127	13.5		56	112	M8×1	140	DKF6325-4
DKF6330-4	63	30	63	6.35	57.9	4	59.0	166.3	972	95	95	20	135	22	115	13.5		50	100	M8×1	147	DKF6330-4
DKF6330-4	63	30	63	9.525	55.6	4	101.0	241.2	1010	107	107	30	147	28	127	13.5		56	112	M8×1	160	DKF6330-4
DKF6340-4	63	40	63	6.35	57.9	4	58.3	164.9	968	95	95	20	135	22	115	13.5		50	100	M8×1	185	DKF6340-4
DKF6340-4	63	40	63	9.525	55.6	4	99.9	239.2	1005	107	107	30	147	28	127	13.5		56	112	M8×1	200	DKF6340-4
DKF8016-5	80	16	80	9.525	72.5	5	140.9	401.0	1480	125	125	25	165	25	145	13.5		67.5	135	M8×1	122	DKF8016-5
DKF8020-5	80	20	80	9.525	72.5	5	140.7	400.5	1510	125	125	25	165	25	145	13.5		67.5	135	M8×1	140	DKF8020-5
DKF8025-4	80	25	80	9.525	72.5	4	114.5	315.7	1222	125	125	25	165	25	145	13.5		67.5	135	M8×1	140	DKF8025-4
DKF8030-4	80	30	80	9.525	72.5	4	114.2	315.0	1232	125	125	25	165	25	145	13.5		67.5	135	M8×1	160	DKF8030-4
DKF8030-4	80	30	80	12.7	70.9	4	217.4	567.9	1564	140	140	25	180	32	160	13.5		75	150	M8×1	170	DKF8030-4
DKF8040-3	80	40	80	9.525	72.5	3	86.9	229.8	921	125	125	25	165	25	145	13.5		67.5	135	M8×1	160	DKF8040-3
DKF8040-3	80	40	80	12.7	70.9	3	165.4	414.3	1176	140	140	25	180	32	160	13.5		75	150	M8×1	170	DKF8040-3

DKFZD high speed precision ball screw

Unit: mm

Note:

1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;
2) When the axial load F is not equal to 0.3Ca, Kc is the stiffness value in the table;

$$K_C = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

3) This type of ball screw pair is suitable for high-speed applications;
4) Normal working ambient temperature range ±80℃;
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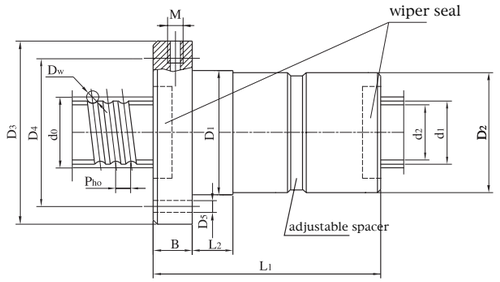

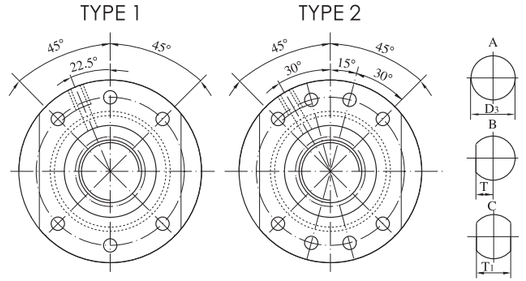

Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension													Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D2(^{-0}_{-0.2})^1$	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKFZD2510-3	25	10	25	3.969	21.7	3	15.7	29.3	522	45	45	20	65	11	54	6.6		25.5	51	M6	104	DKFZD2510-3
DKFZD2510-4	25	10	25	3.969	21.7	4	20.5	39.9	702	45	45	20	65	11	54	6.6		25.5	51	M6	124	DKFZD2510-4
DKFZD3206-4	32	6	32	3.969	28.7	4	23.4	52.8	859	53	53	20	87	12	72	9		34.5	69	M6	96	DKFZD3206-4
DKFZD3206-5	32	6	32	3.969	28.7	5	28.7	66.9	1077	53	53	20	87	12	72	9		34.5	69	M6	108	DKFZD3206-5
DKFZD3210-4	32	10	32	3.969	28.7	4	23.3	52.7	871	53	53	20	87	12	72	9		34.5	69	M6	130	DKFZD3210-4
DKFZD3210-5	32	10	32	3.969	28.7	5	28.6	66.7	1091	53	53	20	87	12	72	9	1	34.5	69	M6	150	DKFZD3210-5
DKFZD3210-4	32	10	32	6.35	26.9	4	42.7	80.7	903	62	62	20	92	14	77	9		37	74	M6	139	DKFZD3210-4
DKFZD3210-5	32	10	32	6.35	26.9	5	52.3	102.3	1132	62	62	20	92	14	77	9		37	74	M6	159	DKFZD3210-5
DKFZD3212-4	32	12	32	3.969	28.7	4	23.3	52.6	871	53	53	20	87	12	72	9		34.5	69	M6	140	DKFZD3212-4
DKFZD3212-5	32	12	32	3.969	28.7	5	28.5	66.6	1092	53	53	20	87	12	72	9		34.5	69	M6	164	DKFZD3212-5
DKFZD3212-4	32	12	32	6.35	26.9	4	42.6	80.6	904	62	62	20	92	14	77	9		37	74	M6	155	DKFZD3212-4
DKFZD3212-5	32	12	32	6.35	26.9	5	52.2	102.1	1132	62	62	20	92	14	77	9		37	74	M6	179	DKFZD3212-5
DKFZD3216-4	32	16	32	6.35	26.9	4	42.3	80.2	899	62	62	20	92	14	77	9		37	74	M6	189	DKFZD3216-4
DKFZD4010-4	40	10	40	6.35	34.9	4	48.0	102.6	1084	70	70	20	100	14	85	9		37.5	75	M8×1	149	DKFZD4010-4
DKFZD4010-5	40	10	40	6.35	34.9	5	58.9	130.0	1358	70	70	20	100	14	85	9		37.5	75	M8×1	169	DKFZD4010-5
DKFZD4012-4	40	12	40	6.35	34.9	4	47.9	102.5	1087	70	70	20	100	14	85	9		37.5	75	M8×1	157	DKFZD4012-4
DKFZD4012-5	40	12	40	6.35	34.9	5	58.8	129.8	1363	70	70	20	100	14	85	9		37.5	75	M8×1	181	DKFZD4012-5
DKFZD4015-5	40	15	40	6.35	34.9	5	58.6	129.5	1364	70	70	20	100	14	85	9		37.5	75	M8×1	204	DKFZD4015-5
DKFZD4016-4	40	16	40	6.35	34.9	4	47.7	102.1	1088	70	70	20	100	14	85	9	2	37.5	75	M8×1	187	DKFZD4016-4
DKFZD4016-5	40	16	40	6.35	34.9	5	58.5	129.4	1363	70	70	20	100	14	85	9		37.5	75	M8×1	219	DKFZD4016-5
DKFZD4020-4	40	20	40	6.35	34.9	4	47.5	101.7	1083	70	70	20	100	14	85	9		37.5	75	M8×1	225	DKFZD4020-4
DKFZD4020-5	40	20	40	6.35	34.9	5	58.2	128.8	1357	70	70	20	100	14	85	9		37.5	75	M8×1	265	DKFZD4020-5
DKFZD4025-4	40	25	40	6.35	34.9	4	47.1	101.0	1073	70	70	20	100	14	85	9		37.5	75	M8×1	259	DKFZD4025-4
DKFZD4030-3	40	30	40	6.35	34.9	3	36.8	77.1	821	70	70	20	100	14	85	9		37.5	75	M8×1	239	DKFZD4030-3

DKFZD high speed precision ball screw

Unit: mm

Note:

1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;
2) When the axial load F is not equal to 0.3Ca, Kc is the stiffness value in the table;

$$K_C = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

3) This type of ball screw pair is suitable for high-speed applications;
4) Normal working ambient temperature range ±80℃;
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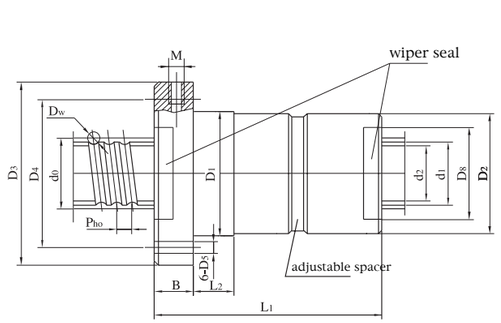
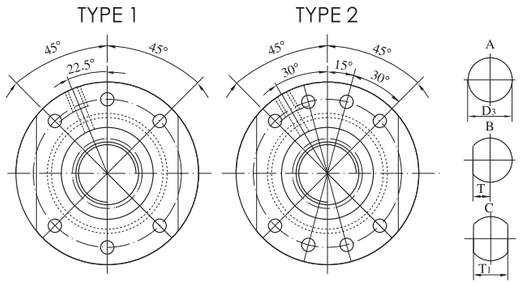


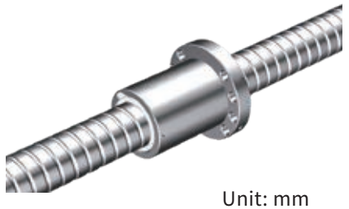


Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension													Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	D2($^{-0.1}_{-0.2}$)	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKFZD5010-4	50	10	50	6.35	44.9	4	53.4	129.9	1293	82	82	20	118	16	100	11		46	92	M8×1	145	DKFZD5010-4
DKFZD5010-5	50	10	50	6.35	44.9	5	65.4	164.5	1620	82	82	20	118	16	100	11		46	92	M8×1	165	DKFZD5010-5
DKFZD5012-4	50	12	50	6.35	44.9	4	53.3	129.8	1300	82	82	20	118	16	100	11		46	92	M8×1	163	DKFZD5012-4
DKFZD5012-5	50	12	50	6.35	44.9	5	65.4	164.4	1629	82	82	20	118	16	100	11		46	92	M8×1	187	DKFZD5012-5
DKFZD5016-4	50	16	50	6.35	44.9	4	53.2	129.5	1307	82	82	20	118	16	100	11		46	92	M8×1	187	DKFZD5016-4
DKFZD5016-5	50	16	50	6.35	44.9	5	65.2	164.0	1637	82	82	20	118	16	100	11		46	92	M8×1	219	DKFZD5016-5
DKFZD5020-4	50	20	50	6.35	44.9	4	53.0	129.1	1307	82	82	20	118	16	100	11		46	92	M8×1	215	DKFZD5020-4
DKFZD5020-5	50	20	50	6.35	44.9	5	65.0	163.6	1637	82	82	20	118	16	100	11		46	92	M8×1	255	DKFZD5020-5
DKFZD5025-4	50	25	50	6.35	44.9	4	52.7	128.6	1301	82	82	20	118	16	100	11		46	92	M8×1	263	DKFZD5025-4
DKFZD5030-4	50	30	50	6.35	44.9	4	52.3	127.9	1291	82	82	20	118	16	100	11		46	92	M8×1	295	DKFZD5030-4
DKFZD5040-3	50	40	50	6.35	44.9	3	40.4	96.2	971	82	82	20	118	16	100	11		46	92	M8×1	295	DKFZD5040-3
DKFZD6310-5	63	10	63	6.35	57.9	5	71.7	206.1	1901	95	95	20	135	22	115	13.5		50	100	M8×1	165	DKFZD6310-5
DKFZD6312-5	63	12	63	6.35	57.9	5	71.6	206.0	1918	95	95	20	135	22	115	13.5		50	100	M8×1	187	DKFZD6312-5
DKFZD6312-5	63	12	63	7.938	56.7	5	97.6	257.2	1983	98	98	20	138	25	118	13.5		51.5	103	M8×1	193	DKFZD6312-5
DKFZD6316-5	63	16	63	6.35	57.9	5	71.5	205.7	1936	95	95	20	135	22	115	13.5		50	100	M8×1	219	DKFZD6316-5
DKFZD6316-5	63	16	63	9.525	55.6	5	125.0	307.9	2065	107	107	30	147	28	127	13.5		56	112	M8×1	254	DKFZD6316-5
DKFZD6320-5	63	20	63	6.35	57.9	5	72.9	212.0	1998	95	95	20	135	22	115	13.5	2	50	100	M8×1	259	DKFZD6320-5
DKFZD6320-5	63	20	63	9.525	55.6	5	124.7	307.3	2072	107	107	30	147	28	127	13.5		56	112	M8×1	290	DKFZD6320-5
DKFZD6325-4	63	25	63	6.35	57.9	4	59.3	166.9	1595	95	95	20	135	22	115	13.5		50	100	M8×1	262.5	DKFZD6325-4
DKFZD6325-4	63	25	63	9.525	55.6	4	101.4	242.0	1654	107	107	30	147	28	127	13.5		56	112	M8×1	290	DKFZD6325-4
DKFZD6330-4	63	30	63	6.35	57.9	4	59.0	166.3	1591	95	95	20	135	22	115	13.5		50	100	M8×1	299	DKFZD6330-4
DKFZD6330-4	63	30	63	9.525	55.6	4	101.0	241.2	1649	107	107	30	147	28	127	13.5		56	112	M8×1	330	DKFZD6330-4
DKFZD6340-3	63	40	63	6.35	57.9	3	44.7	120.9	1169	95	95	20	135	22	115	13.5		50	100	M8×1	295	DKFZD6340-3
DKFZD6340-3	63	40	63	9.525	55.6	3	76.5	175.4	1212	107	107	30	147	28	127	13.5		56	112	M8×1	330	DKFZD6340-3
DKFZD8016-5	80	16	80	9.525	72.5	5	140.9	401.0	2515	125	125	25	165	25	145	13.5		67.5	135	M8×1	254	DKFZD8016-5
DKFZD8020-5	80	20	80	9.525	72.5	5	140.7	400.5	2533	125	125	25	165	25	145	13.5		67.5	135	M8×1	290	DKFZD8020-5
DKFZD8025-4	80	25	80	9.525	72.5	4	114.5	315.7	2029	125	125	25	165	25	145	13.5		67.5	135	M8×1	290	DKFZD8025-4
DKFZD8030-4	80	30	80	9.525	72.5	4	114.2	315.0	2031	125	125	25	165	25	145	13.5		67.5	135	M8×1	330	DKFZD8030-4
DKFZD8030-4	80	30	80	12.7	70.9	4	217.4	567.9	2616	140	140	25	180	32	160	13.5		75	150	M8×1	350	DKFZD8030-4
DKFZD8040-3	80	40	80	9.525	72.5	3	86.9	229.8	1504	125	125	25	165	25	145	13.5		67.5	135	M8×1	330	DKFZD8040-3
DKFZD8040-3	80	40	80	12.7	70.9	3	165.4	414.3	1943	140	140	25	180	32	160	13.5		75	150	M8×1	350	DKFZD8040-3

Compact precision ball screw

The end block circulation structure is used for rolling element circulation, and its running speed is faster than that of inner circulation structure. The high DN value makes it widely used in medium and low speed applications.Compared with DKF/DKFZD high-speed construction, the nut can be smaller with the outer circle.

DKF Compact precision ball screw



Unit: mm

Note:

1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;

2) When the axial load F is not equal to 0.3Ca,

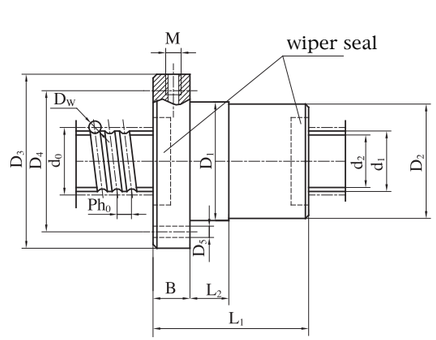
$$K'_c = K_c \left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

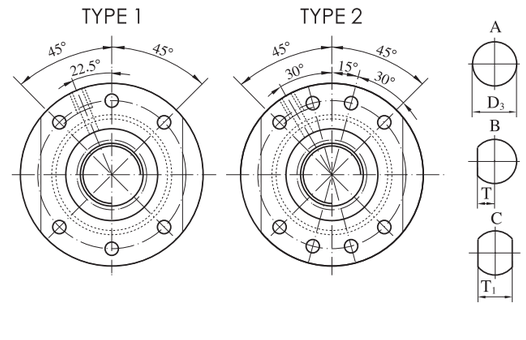
Where Kc is the stiffness value in the table;

3) This type of ball screw is suitable for medium and low speed applications;

4) Normal working ambient temperature range ±80℃;

5) Any special request should be made at the time of ordering.





Code and spec.	Nominal dia d_0	Basic lead P_{h0}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_c N/um	Mounting & connecting dimension													Code and spec.
							Dynamic load C_a kN	Static load C_{0a} kN		D_1(g6)	D2($^{-0.1}_{-0.3}$)	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKF1605-3-D3	16	5	16	3.175	13.3	3	9.4	14.8	212	30	30	15	49	11	39	4.8		20	40	M6	33	DKF1605-3-D3
DKF1605-4-D3	16	5	16	3.175	13.3	4	12.3	20.2	288	30	30	15	49	11	39	4.8		20	40	M6	38	DKF1605-4-D3
DKF2508-4-D3	25	8	25	4.763	21.1	4	26.4	48.4	438	47	47	15	74	11	60	6.6		29	58	M6	56	DKF2508-4-D3
DKF2508-5-D3	25	8	25	4.763	21.1	5	32.3	61.3	549	47	47	15	74	11	60	6.6		29	58	M6	64	DKF2508-5-D3
DKF2510-3-D3	25	10	25	3.175	22.3	3	11.7	23.7	308	40	40	15	62	11	51	6.6		24	48	M6	50	DKF2510-3-D3
DKF2510-4-D3	25	10	25	3.175	22.3	4	15.2	32.3	415	40	40	15	62	11	51	6.6		24	48	M6	60	DKF2510-4-D3
DKF2520-3-D3	25	20	25	3.175	22.3	3	11.6	24.1	314	40	40	15	62	11	51	6.6		24	48	M6	80	DKF2520-3-D3
DKF3208-4-D3	32	8	32	3.969	28.7	4	23.4	52.8	518	50	50	20	82	12	67	9	1	32	64	M8×1	51	DKF3208-4-D3
DKF3208-5-D3	32	8	32	3.969	28.7	5	28.7	66.8	649	50	50	20	82	12	67	9		32	64	M8×1	59	DKF3208-5-D3
DKF3210-4-D3	32	10	32	3.969	28.7	4	23.3	52.7	525	50	50	20	82	12	67	9		32	64	M8×1	51	DKF3210-4-D3
DKF3210-5-D3	32	10	32	3.969	28.7	5	28.6	66.7	658	50	50	20	82	12	67	9		32	64	M8×1	59	DKF3210-5-D3
DKF3210-4-D3	32	10	32	6.35	26.9	4	42.7	80.7	547	57	57	20	87	14	72	9		34.5	69	M8×1	67	DKF3210-4-D3
DKF3210-5-D3	32	10	32	6.35	26.9	5	52.3	102.3	686	57	57	20	87	14	72	9		34.5	69	M8×1	77	DKF3210-5-D3
DKF3212-4-D3	32	12	32	6.35	26.9	4	42.6	80.6	551	57	57	20	87	14	72	9		34.5	69	M8×1	75	DKF3212-4-D3
DKF3212-5-D3	32	12	32	6.35	26.9	5	52.2	102.1	690	57	57	20	87	14	72	9		34.5	69	M8×1	87	DKF3212-5-D3
DKF3216-3-D3	32	16	32	6.35	26.9	3	32.4	58.8	411	57	57	20	87	14	72	9		34.5	69	M8×1	92	DKF3216-3-D3
DKF3216-4-D3	32	16	32	6.35	26.9	4	42.3	80.2	553	57	57	20	87	14	72	9		34.5	69	M8×1	92	DKF3216-4-D3
DKF3820-4-D3	38	20	38	6.35	33	4	46.2	96.2	638	63	63	20	93	14	78	9		35	70	M8×1	108	DKF3820-4-D3
DKF3820-5-D3	38	20	38	6.35	33	5	56.6	121.8	794	63	63	20	93	14	78	9		35	70	M8×1	128	DKF3820-5-D3

DKF compact precision ball screw

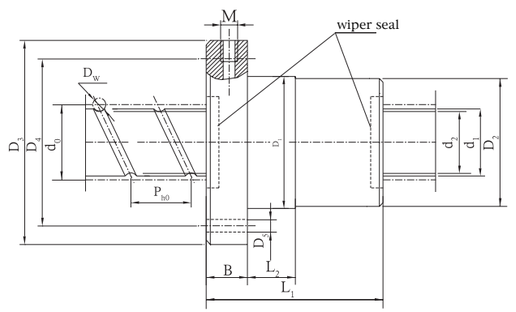
Unit: mm

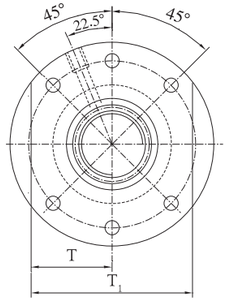
Note:
1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;
2) When the axial load F is not equal to 0.3Ca,

$$K'_c = K_c \left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

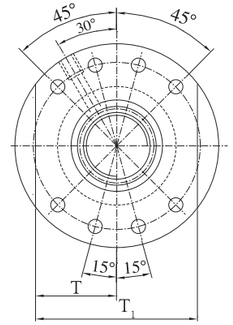
Where Kc is the stiffness value in the table;
3) This type of ball screw is suitable for medium and low speed applications;
4) Normal working ambient temperature range ±80℃;
5) Any special request should be made at the time of ordering.

TYPE 1





TYPE 2



Code and spec.	Nominal dia d_0	Basic lead P_{h0}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_c N/um	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a kN	Static load C_{0a} kN		D_1(g6)	D2($^{-0.1}_{-0.3}$)	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKF4010-4-D3	40	10	40	6.35	34.9	4	48	102.6	648	65	65	20	95	14	80	9		36	72	M8×1	72	DKF4010-4-D3
DKF4010-5-D3	40	10	40	6.35	34.9	5	58.9	130	813	65	65	20	95	14	80	9		36	72	M8×1	82	DKF4010-5-D3
DKF4012-4-D3	40	12	40	6.35	34.9	4	47.9	102.5	656	65	65	20	95	14	80	9		36	72	M8×1	76	DKF4012-4-D3
DKF4012-5-D3	40	12	40	6.35	34.9	5	58.8	129.8	822	65	65	20	95	14	80	9		36	72	M8×1	88	DKF4012-5-D3
DKF4012-4-D3	40	12	40	7.144	34.3	4	56.3	115.9	669	70	70	20	100	14	100	9		37.5	75	M8×1	76	DKF4012-4-D3
DKF4012-5-D3	40	12	40	7.144	34.3	5	69	146.8	838	70	70	20	100	14	100	9		37.5	75	M8×1	88	DKF4012-5-D3
DKF4016-4-D3	40	16	40	6.35	34.9	4	47.7	102.1	663	65	65	20	95	14	80	9		36	72	M8×1	91	DKF4016-4-D3
DKF4016-5-D3	40	16	40	6.35	34.9	5	58.5	129.4	831	65	65	20	95	14	80	9		36	72	M8×1	107	DKF4016-5-D3
DKF4020-4-D3	40	20	40	6.35	34.9	4	47.5	101.7	665	65	65	20	95	14	80	9		36	72	M8×1	110	DKF4020-4-D3
DKF4020-5-D3	40	20	40	6.35	34.9	5	58.2	128.8	833	65	65	20	95	14	80	9		36	72	M8×1	130	DKF4020-5-D3
DKF4512-4-D3	45	12	45	7.144	39.3	4	59.3	129.8	713	75	75	20	118	16	100	11	2	46	92	M8×1	76	DKF4512-4-D3
DKF4512-5-D3	45	12	45	7.144	39.3	5	72.7	164.4	895	75	75	20	118	16	100	11		46	92	M8×1	88	DKF4512-5-D3
DKF5010-4-D3	50	10	50	6.35	44.9	4	53.4	129.9	763	75	75	20	118	16	100	11		46	92	M8×1	70	DKF5010-4-D3
DKF5010-5-D3	50	10	50	6.35	44.9	5	65.4	164.5	957	75	75	20	118	16	100	11		46	92	M8×1	80	DKF5010-5-D3
DKF5012-4-D3	50	12	50	6.35	44.9	4	53.3	129.8	775	75	75	20	118	16	100	11		46	92	M8×1	79	DKF5012-4-D3
DKF5012-5-D3	50	12	50	6.35	44.9	5	65.4	164.4	972	75	75	20	118	16	100	11		46	92	M8×1	91	DKF5012-5-D3
DKF5016-4-D3	50	16	50	6.35	44.9	4	53.2	129.5	789	75	75	20	118	16	100	11		46	92	M8×1	91	DKF5016-4-D3
DKF5016-5-D3	50	16	50	6.35	44.9	5	65.2	164	990	75	75	20	118	16	100	11		46	92	M8×1	107	DKF5016-5-D3
DKF5020-4-D3	50	20	50	6.35	44.9	4	53	129.1	796	75	75	20	118	16	100	11		46	92	M8×1	105	DKF5020-4-D3
DKF5020-5-D3	50	20	50	6.35	44.9	5	65	163.6	998	75	75	20	118	16	100	11		46	92	M8×1	125	DKF5020-5-D3
DKF5025-4-D3	50	25	50	6.35	44.9	4	52.7	128.6	798	75	75	20	118	16	100	11		46	92	M8×1	129	DKF5025-4-D3
DKF6330-3-D3	63	30	63	7.938	56.7	4	78.7	201.2	975	95	95	20	135	22	115	13.5		50	100	M8×1	152	DKF6330-4-D3

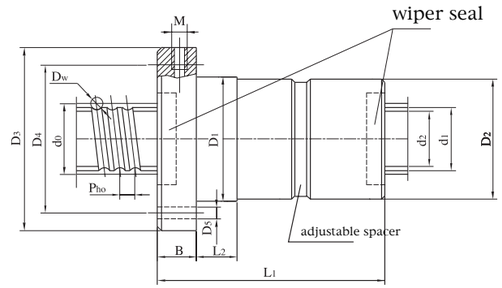
DKFZD Compact precision ball screw

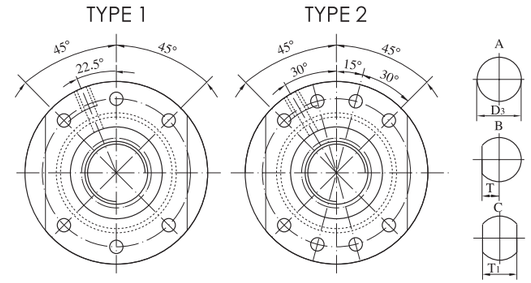
Unit: mm

Note:
1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;
2) When the axial load F is not equal to 0.3Ca,

$$K_C' = K_C\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

Where Kc is the stiffness value in the table;
3) This type of ball screw is suitable for medium and low speed applications;
4) Normal working ambient temperature range ±80℃;
5) Any special request should be made at the time of ordering.





Code and spec.	Nominal dia d_0	Basic lead P_{h0}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_c N/um	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a kN	Static load C_{oa} kN		D_1(g6)	$D_2(^{-0.1}_{-0.3})$	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKFZD1605-3-D3	16	5	16	3.175	13.3	3	9.4	14.8	351	30	30	15	49	11	39	4.8		20	40	M6	70	DKFZD1605-3-D3
DKFZD1605-4-D3	16	5	16	3.175	13.3	4	12.3	20.2	288	30	30	15	49	11	39	4.8		20	40	M6	80	DKFZD1605-4-D3
DKFZD2508-4-D3	25	8	25	4.763	21.1	4	26.4	48.4	438	47	47	15	74	11	60	6.6		29	58	M6	116	DKFZD2508-4-D3
DKFZD2508-5-D3	25	8	25	4.763	21.1	5	32.3	61.3	549	47	47	15	74	11	60	6.6		29	58	M6	132	DKFZD2508-5-D3
DKFZD2510-3-D3	25	10	25	3.175	22.3	3	11.7	23.7	508	40	40	15	62	11	51	6.6		24	48	M6	104	DKFZD2510-3-D3
DKFZD2510-4-D3	25	10	25	3.175	22.3	4	15.2	32.3	683	40	40	15	62	11	51	6.6		24	48	M6	124	DKFZD2510-4-D3
DKFZD2520-3-D3	25	20	25	3.175	22.3	3	11.6	24.1	508	40	40	15	62	11	51	6.6		24	48	M6	165	DKFZD2520-3-D3
DKFZD3208-4-D3	32	8	32	3.969	28.7	4	23.4	52.8	518	50	50	20	82	12	67	9	1	32	64	M8×1	106	DKFZD3208-4-D3
DKFZD3208-5-D3	32	8	32	3.969	28.7	5	28.7	66.8	649	50	50	20	82	12	67	9		32	64	M8×1	122	DKFZD3208-5-D3
DKFZD3210-4-D3	32	10	32	3.969	28.7	4	23.3	52.7	525	50	50	20	82	12	67	9		32	64	M8×1	130	DKFZD3210-4-D3
DKFZD3210-5-D3	32	10	32	3.969	28.7	5	28.6	66.7	658	50	50	20	82	12	67	9		32	64	M8×1	150	DKFZD3210-5-D3
DKFZD3210-4-D3	32	10	32	6.35	26.9	4	42.7	80.7	903	57	57	20	87	14	72	9		34.5	69	M8×1	139	DKFZD3210-4-D3
DKFZD3210-5-D3	32	10	32	6.35	26.9	5	52.3	102.3	1132	57	57	20	87	14	72	9		34.5	69	M8×1	159	DKFZD3210-5-D3
DKFZD3212-4-D3	32	12	32	6.35	26.9	4	42.6	80.6	904	57	57	20	87	14	72	9		34.5	69	M8×1	155	DKFZD3212-4-D3
DKFZD3212-5-D3	32	12	32	6.35	26.9	5	52.2	102.1	1132	57	57	20	87	14	72	9		34.5	69	M8×1	179	DKFZD3212-5-D3
DKFZD3216-3-D3	32	16	32	6.35	26.9	3	32.4	58.8	411	57	57	20	87	14	72	9		34.5	69	M8×1	157	DKFZD3216-3-D3
DKFZD3216-4-D3	32	16	32	6.35	26.9	4	42.3	80.2	899	57	57	20	87	14	72	9		34.5	69	M8×1	189	DKFZD3216-4-D3
DKFZD3820-4-D3	38	20	38	6.35	33	4	46.2	96.2	638	63	63	20	93	14	78	9	2	35	70	M8X1	221	DKFZD3820-4-D3
DKFZD3820-5-D3	38	20	38	6.35	33	5	56.6	121.8	1296	63	63	20	93	14	78	9		35	70	M8X1	261	DKFZD3820-5-D3

DKFZD Compact precision ball screw

Unit: mm

Note:

1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;

2) When the axial load F is not equal to 0.3Ca,

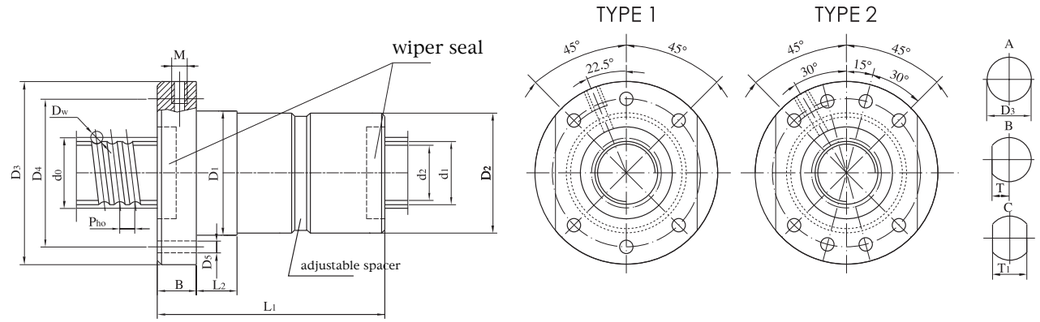
$$K_c' = K_c\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

Where Kc is the stiffness value in the table;

3) This type of ball screw is suitable for medium and low speed applications;

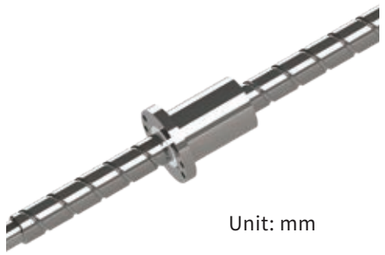
4) Normal working ambient temperature range ±80℃;

5) Any special request should be made at the time of ordering.



Code and spec.	Nominal dia d_0	Basic lead P_{h0}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_c N/um	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a kN	Static load C_{0a} kN		D_1(g6)	$D_2(^{-0.1}_{-0.3})$	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKFZD4010-4-D3	40	10	40	6.35	34.9	4	48	102.6	1084	65	65	20	95	14	80	9		36	72	M8×1	149	DKFZD4010-4-D3
DKFZD4010-5-D3	40	10	40	6.35	34.9	5	58.9	130	1358	65	65	20	95	14	80	9		36	72	M8×1	169	DKFZD4010-5-D3
DKFZD4012-4-D3	40	12	40	6.35	34.9	4	47.9	102.5	1087	65	65	20	95	14	80	9		36	72	M8×1	157	DKFZD4012-4-D3
DKFZD4012-5-D3	40	12	40	6.35	34.9	5	58.8	129.8	1363	65	65	20	95	14	80	9		36	72	M8×1	181	DKFZD4012-5-D3
DKFZD4012-4-D3	40	12	40	7.144	34.3	4	56.3	115.9	669	70	70	20	100	14	100	9		37.5	75	M8×1	157	DKFZD4012-4-D3
DKFZD4012-5-D3	40	12	40	7.144	34.3	5	69	146.8	838	70	70	20	100	14	100	9		37.5	75	M8×1	181	DKFZD4012-5-D3
DKFZD4016-4-D3	40	16	40	6.35	34.9	4	47.7	102.1	1088	65	65	20	95	14	80	9		36	72	M8×1	187	DKFZD4016-4-D3
DKFZD4016-5-D3	40	16	40	6.35	34.9	5	58.5	129.4	1363	65	65	20	95	14	80	9		36	72	M8×1	219	DKFZD4016-5-D3
DKFZD4020-4-D3	40	20	40	6.35	34.9	4	47.5	101.7	1083	65	65	20	95	14	80	9		36	72	M8×1	225	DKFZD4020-4-D3
DKFZD4020-5-D3	40	20	40	6.35	34.9	5	58.2	128.8	1357	65	65	20	95	14	80	9		36	72	M8×1	265	DKFZD4020-5-D3
DKFZD4512-4-D3	45	12	45	7.144	39.3	4	59.3	129.8	713	75	75	20	118	16	100	11	2	46	92	M8×1	157	DKFZD4512-4-D3
DKFZD4512-5-D3	45	12	45	7.144	39.3	5	72.7	164.4	895	75	75	20	118	16	100	11		46	92	M8×1	181	DKFZD4512-5-D3
DKFZD5010-4-D3	50	10	50	6.35	44.9	4	53.4	129.9	1293	75	75	20	118	16	100	11		46	92	M8×1	145	DKFZD5010-4-D3
DKFZD5010-5-D3	50	10	50	6.35	44.9	5	65.4	164.5	1620	75	75	20	118	16	100	11		46	92	M8×1	165	DKFZD5010-5-D3
DKFZD5012-4-D3	50	12	50	6.35	44.9	4	53.3	129.8	1300	75	75	20	118	16	100	11		46	92	M8×1	163	DKFZD5012-4-D3
DKFZD5012-5-D3	50	12	50	6.35	44.9	5	65.4	164.4	1629	75	75	20	118	16	100	11		46	92	M8×1	187	DKFZD5012-5-D3
DKFZD5016-4-D3	50	16	50	6.35	44.9	4	53.2	129.5	1307	75	75	20	118	16	100	11		46	92	M8×1	187	DKFZD5016-4-D3
DKFZD5016-5-D3	50	16	50	6.35	44.9	5	65.2	164	1637	75	75	20	118	16	100	11		46	92	M8×1	219	DKFZD5016-5-D3
DKFZD5020-4-D3	50	20	50	6.35	44.9	4	53	129.1	1307	75	75	20	118	16	100	11		46	92	M8×1	215	DKFZD5020-4-D3
DKFZD5020-5-D3	50	20	50	6.35	44.9	5	65	163.6	1637	75	75	20	118	16	100	11		46	92	M8×1	255	DKFZD5020-5-D3
DKFZD5025-4-D3	50	25	50	6.35	44.9	4	52.7	128.6	798	75	75	20	118	16	100	11		46	92	M8×1	263	DKFZD5025-4-D3
DKFZD6330-4-D3	63	30	63	7.938	56.7	4	78.7	201.2	1599	95	95	20	135	22	115	13.5		50	100	M8×1	309	DKFZD6330-4-D3

DKF big lead and high speed ball screw



Unit: mm

Note:

1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;

2) When the axial load F is not equal to 0.3Ca,

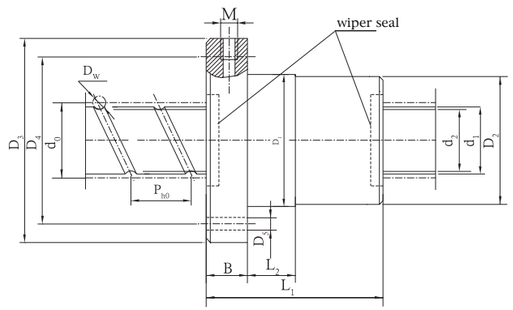
$$K_C' = K_C \left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

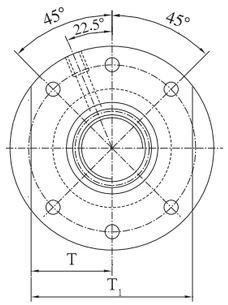
Where Kc is the stiffness value in the table;

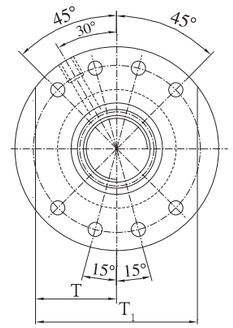
3) This type of ball screw is suitable for medium and low speed applications;

4) Normal working ambient temperature range ±80°C;

5) Any special request should be made at the time of ordering.





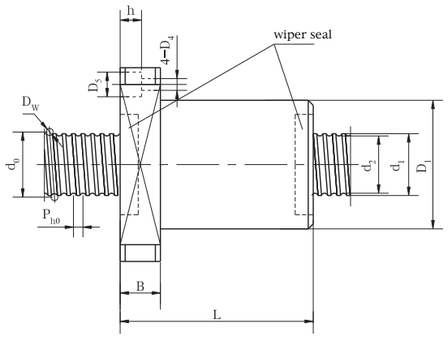


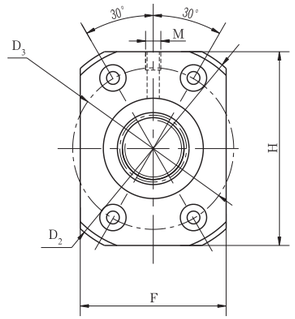
Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	D2($^{-0.1}_{-0.2}$)	L_2	D_3	B	D_4	D_5	TYPE	T	T_1	M	L_1	
DKF1616-2	16	16	16	13.7	2.778	2	5.2	8.3	358	32	32	10	53	12	42	4.5	1	17	34	M6	45	DKF1616-2
DKF2020-2	20	20	20	17.4	3.175	2	7.0	12.0	441	39	39	10	62	12	50	6.6		24	48	M6	60	DKF2020-2
DKF2525-2	25	25	25	22	3.969	2	10.4	18.8	544	47	47	10	68	12	57	6.6		27	54	M6	72	DKF2525-2
DKF3232-2	32	32	32	28.1	4.763	2	14.8	28.4	667	54	54	10	86	14	71	9		33	66	M6	88	DKF3232-2
DKF3240-2	32	40	32	28.2	5	2	15.7	30.2	665	58	58	10	88	14	73	9		33	66	M6	112	DKF3240-2
DKF4040-2	40	40	40	34.9	6.35	2	24.3	48.1	841	70	70	20	100	14	85	9		37.5	75	M8×1	101	DKF4040-2
DKF5050-2	50	50	50	44.9	6.35	2	26.8	60.2	1001	82	82	30	118	16	100	11		46	92	M8×1	134	DKF5050-2
DKF6363-2	63	63	63	57.9	6.35	2	29.7	77.0	1213	95	95	30	135	22	115	13.5		50	100	M8×1	151	DKF6363-2
DKF8040-4	80	40	80	70.9	12.7	4	239.8	204.0	1582	140	140	30	190	32	165	13.5	2	80	160	M8×1	210	DKF8040-4
DKF10040-4	100	40	97	87.9	12.7	4	267.0	889.3	7605	160	160	30	220	36	190	17.5		90	180	M8×1	230	DKF10040-4
DKF10050-4	100	50	97	87.9	12.7	4	265.4	885.3	7568	160	160	30	220	36	190	17.5		90	180	M8×1	270	DKF10050-4
DKF10050-4	100	50	97	85.6	15.875	4	360.5	1097.9	7786	170	170	30	244	36	210	22		95	190	M8×1	270	DKF10050-4
DKF12560-3	125	60	124	114.4	12.7	3	220.8	811.6	6684	190	190	30	264	36	220	22		110	220	M8×1	250	DKF12560-3

JF miniature ball screw

Unit: mm

Note:
1) Normal working ambient temperature range ±80℃
2) Special requests should be made at the time of ordering





Code and spec.	Nominal dia d_0	Basic lead P_{h0}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Mounting & connecting dimension										Code and spec.
							Dynamic load C_a kN	Static load C_{0a} kN	D_1(g6)	D_2	L	D_3	B	h	D_4	D_5	F	H	M	
JF0801.5-4	8	1.5	8	1.2	7	4	2.2	3.1	16	32	25	23	6	3.5	3.4	6.5	20	29	M2.5	JF0801.5-4
JF0802-4	8	2	8	1.588	6.7	4	2.9	3.7	16	32	27	23	6	3.5	3.4	6.5	20	29	M2.5	JF0802-4
JF0802.5-4	8	2.5	8	1.588	6.7	4	2.9	3.7	16	32	30	23	6	3.5	3.4	6.5	20	29	M2.5	JF0802.5-4
JF1001.5-4	10	1.5	9.8	1.2	8.9	4	2.5	4.2	18	38	27	27	8	4.5	4.5	8	24	34	M2.5	JF1001.5-4
JF1002-4	10	2	9.8	1.588	8.5	4	3.5	5.1	18	38	29	27	8	4.5	4.5	8	24	34	M2.5	JF1002-4
JF1002.5-4	10	2.5	9.5	2	7.9	4	4.4	5.9	18	38	32	27	8	4.5	4.5	8	24	34	M2.5	JF1002.5-4
JF1201.5-4	12	1.5	11.8	1.2	10.8	4	2.7	5.2	20	40	27	29	8	4.5	4.5	8	25	36	M2.5	JF1201.5-4
JF1202-4	12	2	11.9	1.588	10.6	4	3.9	6.6	20	40	29	29	8	4.5	4.5	8	25	36	M2.5	JF1202-4
JF1202.5-4	12	2.5	11.7	2	10.1	4	5.1	7.6	20	40	33	29	8	4.5	4.5	8	25	36	M2.5	JF1202.5-4
JF1203-4	12	3	11.3	2.381	9.6	4	5.7	7.6	20	43	36	32	8	4.5	4.5	8	27	38	M2.5	JF1203-4
JF1602-4	16	2	15.9	1.588	14.6	4	4.6	9.5	25	47	35	35	10	5.5	5.5	9.5	30	43	M6	JF1602-4
JF1602.5-4	16	2.5	15.7	2	14.2	4	6.1	11.0	25	47	33	35	10	5.5	5.5	9.5	30	43	M6	JF1602.5-4
JF1603-4	16	3	15.3	2.381	13.5	4	7.5	12.3	25	47	38	35	10	5.5	5.5	9.5	30	43	M6	JF1603-4
JF2002-4	20	2	19.9	1.588	18.8	4	5.2	12.4	30	52	35	40	10	5.5	5.5	9.5	32	47	M6	JF2002-4
JF2002.5-4	20	2.5	19.7	2	18.1	4	6.9	14.4	30	52	33	40	10	5.5	5.5	9.5	32	47	M6	JF2002.5-4
JF2003-4	20	3	19.3	2.381	17.5	4	8.5	16.4	30	52	38	40	10	5.5	5.5	9.5	32	47	M6	JF2003-4

JF/JFZD large and heavy ball screw

Applications

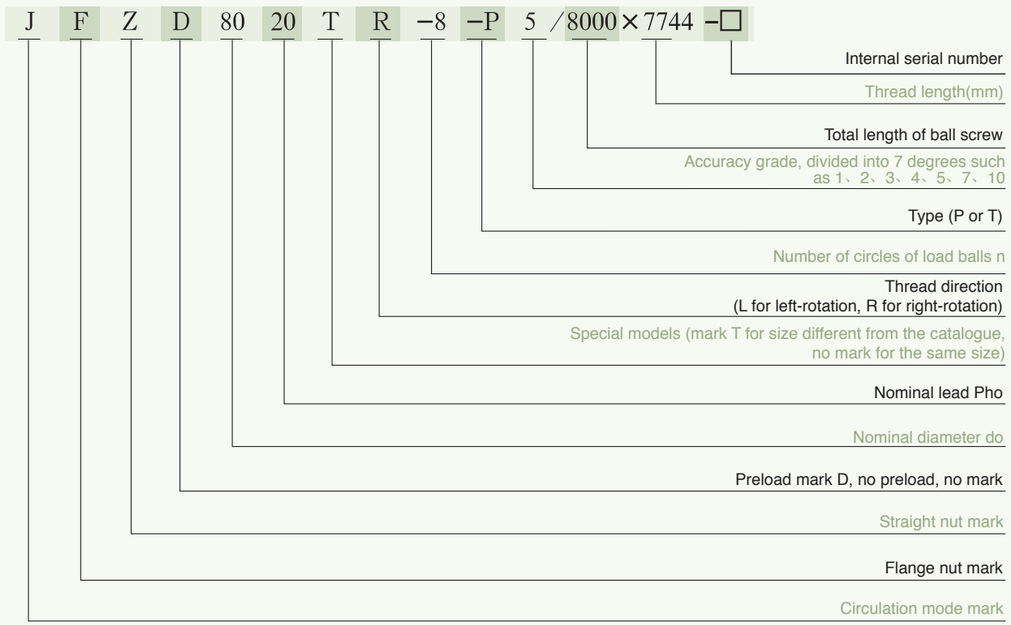
Large and heavy-duty CNC lathes, CNC boring machines, CNC milling machines, large steel smelting equipment, jacks and spinning machines and other mechanical equipment.

Product design, manufacturing and testing technology introduction

Length and heavy load has always been an important problem for manufacturing large heavy duty ball screw to overcome, this series of products to overcome the design, heat treatment, straightening, raceway forming processing and dynamic detection technology, in the structural design of the product with a multi-path large-diameter 80 ball circulation loop design structure, the maximum rated dynamic load of the product 126 tons, the maximum rated static load of 595 tons.

Nanjing Technical Brand is gold Service is heart Equipment Manufacturing Co., Ltd. has put into use 10 meters large lathe, 10 meters hard rotary milling machine, 10 meters large grinding machine, 10 meters medium frequency quenching machine, 10 meters large straightening machine, 10 meters laser screw (pair) travel error measuring instrument and a series of equipment, taking the lead in establishing the first single 10 meters ball screw production line in China. Among them, the 10-meter laser ball screw travel error measuring instrument has passed the calibration and put into use by Jiangsu Institute of Metrology Science, which solves the key technology in the dynamic detection process of a single 10-meter ball lead screw

Code and spec.



Specifications and dynamic and static load parameter table

Nominal diameter(mm)	Basic lead (mm)	Ball dia (mm)	Rated dynamic load Ca (kN) with different circles n			Rated static load Coa (kN) with different circles n		
D_0	P_h	D_w	n=4	n=5	n=8	n=4	n=5	n=8
80	20	12.700			401.0			1212.1
	25	12.700		267.1	400.2		756.3	1210.1
	32	12.700		266.1	398.7		754.1	1206.6
100	20	12.700		297	444.9		954.3	1526.9
	25	15.875		402.7	603.3		1182.0	1891.2
	32	15.875		401.7	601.8		1179.7	1887.5
	40	15.875	330.3			941.1		
125	20	12.700		341.2	511.2		1298.3	2077.3
	25	18.256		527.5	790.2		1669.3	2670.9
	32	20.638		593.2	888.7		1746.6	2794.6
	40	20.638	488.5			1394.9		
160	20	12.700		380.6	570.2		1692.8	2708.5
	25	18.256		591.2	885.7		2178.5	3485.6
	32	20.638		688.7	1031.7		2393.8	3830.0
	40	25.4	740.3			2270.5		
200	25	18.256		669.6	1003.2		2889.9	4623.9
	32	20.638		780.8	1169.7		3172.9	5076.6
	40	25.4	850.6		1543.9	3055.3		6110.6

JF type large heavy load ball screw

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

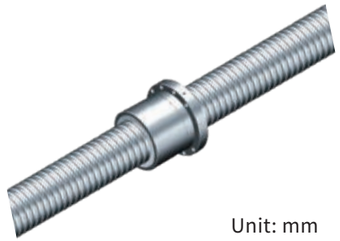
2.When axial load F is not equal to $0.3C_a$,

$$K_c = K(\frac{F}{0.3C_a})^{\frac{1}{3}}$$

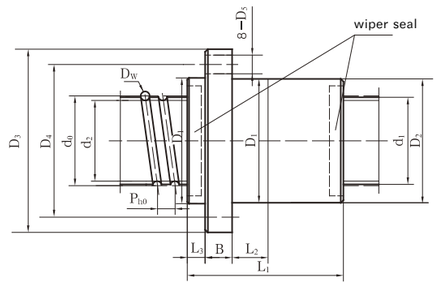
In formula:

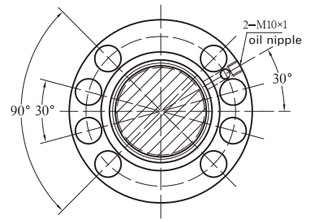
K is rigidity value shown in Table.

3.This type ball screw can be used in high temperature working environment



Unit: mm





Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension								Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2(^{-0.1}_{-0.2})$	L_2	D_3	B	D_5	D_4	L_1	
JF8020-8	80	20	80	12.7	70.9	8	401.0	1212.1	4020	125	125	25	170	32	13.5	150	218	JF 8020-8
JF8025-5	80	25	80	12.7	70.9	5	267.1	756.3	2582	125	125	25	170	32	13.5	150	189	JF 8025-5
JF8025-8	80	25	80	12.7	70.9	8	400.2	1210.1	4046	125	125	25	170	32	13.5	150	264	JF 8025-8
JF8032-5	80	32	80	12.7	70.9	5	266.1	754.1	2590	125	125	25	170	36	13.5	150	231	JF 8032-5
JF8032-8	80	32	80	12.7	70.9	8	398.7	1206.6	4057	125	125	25	170	36	13.5	150	327	JF 8032-8
JF10020-5	100	20	97	12.7	87.9	5	297.0	954.3	3060	150	150	25	207	32	17.5	180	160	JF 10020-5
JF10020-8	100	20	97	12.7	87.9	8	444.9	1526.9	4795	150	150	25	207	32	17.5	180	220	JF 10020-8
JF10025-5	100	25	97	15.875	85.7	5	402.7	1182.0	3163	150	150	25	207	32	17.5	180	196	JF 10025-5
JF10025-8	100	25	97	15.875	85.7	8	603.3	1891.2	4956	150	150	25	207	32	17.5	180	271	JF 10025-8
JF10032-5	100	32	97	15.875	85.7	5	401.7	1179.7	3185	150	150	25	207	36	17.5	180	240	JF 10032-5
JF10032-8	100	32	97	15.875	85.7	8	601.8	1887.5	4990	150	150	25	207	36	17.5	180	336	JF 10032-8
JF10040-4	100	40	97	15.875	85.7	4	330.3	941.1	2580	150	150	40	207	36	17.5	180	238	JF 10040-4
JF12520-5	125	20	123.5	12.7	114.4	5	341.2	1298.3	3781	170	170	25	244	36	22	210	158	JF 12520-5
JF12520-8	125	20	123.5	12.7	114.4	8	511.2	2077.3	5929	170	170	25	244	36	22	210	218	JF 12520-8
JF12525-5	125	25	123.5	18.256	110.6	5	527.5	1669.3	3749	190	190	25	258	36	22	224	204	JF 12525-5
JF12525-8	125	25	123.5	18.256	110.6	8	790.2	2670.9	5876	190	190	25	258	36	22	224	279	JF 12525-8
JF12532-5	125	32	123.5	20.638	109.2	5	593.2	1746.6	3610	190	190	25	258	36	22	224	252	JF 12532-5
JF12532-8	125	32	123.5	20.638	109.2	8	888.7	2794.6	5656	190	190	25	258	36	22	224	348	JF 12532-8
JF12540-4	125	40	123.5	20.638	109.2	4	488.5	1394.9	2933	190	190	40	258	40	22	224	252	JF 12540-4
JF16020-5	160	20	156.5	12.7	147.4	5	380.6	1692.8	4621	220	220	25	294	40	22	260	163	JF 16020-5
JF16020-8	160	20	156.5	12.7	147.4	8	570.2	2708.5	7248	220	220	25	294	40	22	260	223	JF 16020-8
JF16025-5	160	25	156.5	18.256	143.6	5	591.2	2178.5	4581	240	240	40	314	40	22	280	201	JF 16025-5
JF16025-8	160	25	156.5	18.256	143.6	8	885.7	3485.6	7181	240	240	40	314	40	22	280	276	JF 16025-8
JF16032-5	160	32	156.5	20.638	142.2	5	688.7	2393.8	4612	240	240	40	314	40	22	280	241	JF 16032-5
JF16032-8	160	32	156.5	20.638	142.2	8	1031.7	3830.0	7228	240	240	40	314	40	22	280	337	JF 16032-8
JF16040-4	160	40	156.5	25.4	138.6	4	740.3	2270.5	3752	240	240	40	314	40	22	280	251	JF 16040-4
JF20025-5	200	25	196.5	18.256	183.6	5	669.6	2889.9	5582	280	280	40	349	50	22	315	195	JF 20025-5
JF20025-8	200	25	196.5	18.256	183.6	8	1003.2	4623.9	8755	280	280	40	349	50	22	315	270	JF 20025-8
JF20032-5	200	32	196.5	20.638	182.2	5	780.8	3172.9	5648	280	280	40	349	50	22	315	242	JF 20032-5
JF20032-8	200	32	196.5	20.638	182.2	8	1169.7	5076.6	8855	280	280	40	349	50	22	315	338	JF 20032-8
JF20040-4	200	40	196.5	25.4	178.6	4	850.6	3055.3	4721	300	300	40	369	50	22	335	252	JF 20040-4
JF20040-8	200	40	196.5	25.4	178.6	8	1543.9	6110.6	9159	300	300	40	369	50	22	335	412	JF 20040-8

JFZD heavy load ball screw

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

2.When axial load F is not equal to $0.3C_a$,

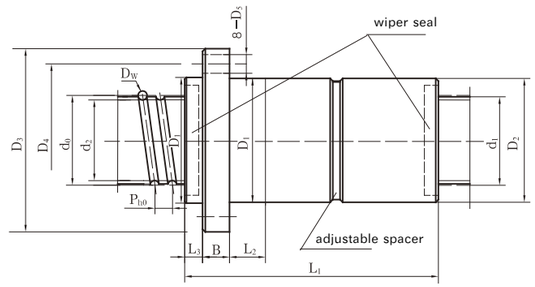
$$K_c = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

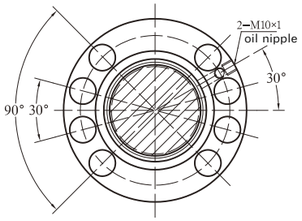
In formula:

K is rigidity value shown in Table.

3.This type ball screw can be used in high temperature working environment

Unit: mm





Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension								Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2(^{-0.1}_{-0.2})$	L_2	D_3	B	D_5	D_4	L_1	
JFZD8020-8	80	20	80	12.7	70.9	8	401.0	1212.1	6572	125	125	25	170	32	13.5	150	412	JFZD 8020-8
JFZD8025-5	80	25	80	12.7	70.9	5	267.1	756.3	4199	125	125	25	170	32	13.5	150	348	JFZD 8025-5
JFZD8025-8	80	25	80	12.7	70.9	8	400.2	1210.1	6575	125	125	25	170	32	13.5	150	498	JFZD 8025-8
JFZD8032-5	80	32	80	12.7	70.9	5	266.1	754.1	4189	125	125	25	170	36	13.5	150	425	JFZD 8032-5
JFZD8032-8	80	32	80	12.7	70.9	8	398.7	1206.6	6559	125	125	25	170	36	13.5	150	617	JFZD 8032-8
JFZD10020-5	100	20	97	12.7	87.9	5	297.0	954.3	5031	150	150	25	207	32	17.5	180	300	JFZD 10020-5
JFZD10020-8	100	20	97	12.7	87.9	8	444.9	1526.9	7879	150	150	25	207	32	17.5	180	420	JFZD 10020-8
JFZD10025-5	100	25	97	15.875	85.7	5	402.7	1182.0	5176	150	150	25	207	32	17.5	180	371	JFZD 10025-5
JFZD10025-8	100	25	97	15.875	85.7	8	603.3	1891.2	8106	150	150	25	207	32	17.5	180	521	JFZD 10025-8
JFZD10032-5	100	32	97	15.875	85.7	5	401.7	1179.7	5179	150	150	25	207	36	17.5	180	446	JFZD 10032-5
JFZD10032-8	100	32	97	15.875	85.7	8	601.8	1887.5	8109	150	150	25	207	36	17.5	180	638	JFZD 10032-8
JFZD10040-4	100	40	97	15.875	85.7	4	330.3	941.1	4175	150	150	40	207	36	17.5	180	436	JFZD 10040-4
JFZD12520-5	125	20	123.5	12.7	114.4	5	341.2	1298.3	6349	170	170	25	244	36	22	210	298	JFZD 12520-5
JFZD12520-8	125	20	123.5	12.7	114.4	8	511.2	2077.3	9946	170	170	25	244	36	22	210	418	JFZD 12520-8
JFZD12525-5	125	25	123.5	18.256	110.6	5	527.5	1669.3	6168	190	190	25	258	36	22	224	374	JFZD 12525-5
JFZD12525-8	125	25	123.5	18.256	110.6	8	790.2	2670.9	9660	190	190	25	258	36	22	224	524	JFZD 12525-8
JFZD12532-5	125	32	123.5	20.638	109.2	5	593.2	1746.6	5892	190	190	25	258	36	22	224	476	JFZD 12532-5
JFZD12532-8	125	32	123.5	20.638	109.2	8	888.7	2794.6	9226	190	190	25	258	36	22	224	668	JFZD 12532-8
JFZD12540-4	125	40	123.5	20.638	109.2	4	488.5	1394.9	4763	190	190	40	258	40	22	224	470	JFZD 12540-4
JFZD16020-5	160	20	156.5	12.7	147.4	5	380.6	1692.8	7803	220	220	25	294	40	22	260	303	JFZD 16020-5
JFZD16020-8	160	20	156.5	12.7	147.4	8	570.2	2708.5	12225	220	220	25	294	40	22	260	423	JFZD 16020-8
JFZD16025-5	160	25	156.5	18.256	143.6	5	591.2	2178.5	7585	240	240	40	314	40	22	280	380	JFZD 16025-5
JFZD16025-8	160	25	156.5	18.256	143.6	8	885.7	3485.6	11879	240	240	40	314	40	22	280	530	JFZD 16025-8
JFZD16032-5	160	32	156.5	20.638	142.2	5	688.7	2393.8	7573	240	240	40	314	40	22	280	433	JFZD 16032-5
JFZD16032-8	160	32	156.5	20.638	142.2	8	1031.7	3830.0	11860	240	240	40	314	40	22	280	625	JFZD 16032-8
JFZD16040-4	160	40	156.5	25.4	138.6	4	740.3	2270.5	6130	240	240	40	314	40	22	280	451	JFZD 16040-4
JFZD20025-5	200	25	196.5	18.256	183.6	5	669.6	2889.9	9398	280	280	40	349	50	22	315	358	JFZD 20025-5
JFZD20025-8	200	25	196.5	18.256	183.6	8	1003.2	4623.9	14724	280	280	40	349	50	22	315	508	JFZD 20025-8
JFZD20032-5	200	32	196.5	20.638	182.2	5	780.8	3172.9	9402	280	280	40	349	50	22	315	434	JFZD 20032-5
JFZD20032-8	200	32	196.5	20.638	182.2	8	1169.7	5076.6	14728	280	280	40	349	50	22	315	626	JFZD 20032-8
JFZD20040-4	200	40	196.5	25.4	178.6	4	850.6	3055.3	7760	300	300	40	369	50	22	335	452	JFZD 20040-4

FF type internal circulation floating ball screw /
FFZ type internal circulation floating ball screw to increase ball diameter pretighten ball screw

Unit: mm

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

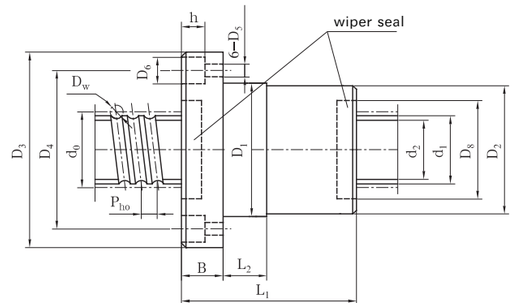
2.When axial load F is not equal to $0.3C_a$,

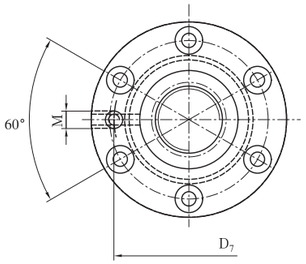
$$K_c = K(\frac{F}{0.3C_a})^{\frac{1}{3}}$$

In formula:

K is rigidity value shown in Table.

3.The normal working environment temperature for FF type ball screw is ±80℃.





Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2{}^{(-0.1)}_{(-0.2)}$	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
FF1204-3	12	4	11.3	2.381	9.5	3	5.3	7.3	148	22	22	10	44	8	32	4.8	8.5	4.5	M2.5	16	35	FF1204-3
FF1604-3	16	4	16	2.381	14.2	3	6.7	11.6	209	28	28	10	52	10	38	5.8	10	6	M6	20	37	FF1604-3
FF1605-3	16	5	16	3.5	13.4	3	10.6	15.8	209	28	28	10	52	10	38	5.8	10	6	M6	22	42	FF1605-3
FF2004L-3	20	4	20	2.381	18.2	3	7.4	14.7	249	36	36	10	62	11	48	5.8	10	6	M6	25	38	FF2004L-3
FF2004R-3	20	4	20	3	17.8	3	9.8	17.5	245	36	36	10	62	11	48	5.8	10	6	M6	25	38	FF2004R-3
FF2005-3	20	5	20	3.5	17.4	3	11.9	19.8	250	36	36	10	62	11	48	5.8	10	6	M6	25	43	FF2005-3
FF2504-3	25	4	25	3	22.8	3	11.3	23.3	296	40	40	10	66	11	53	5.8	10	6	M6	30	38	FF2504-3
FF2505-3	25	5	25	3.5	22.4	3	13.7	26.4	302	40	40	10	66	11	53	5.8	10	6	M6	30	43	FF2505-3
FF2506-3	25	6	25	3.969	22	3	15.8	28.9	303	40	40	10	66	11	53	5.8	10	6	M6	30	49	FF2506-3
FF3204-3	32	4	32	3	29.8	3	12.5	30.1	351	50	50	10	76	11	63	5.8	10	6	M6	38	38	FF3204-3
FF3204-5	32	4	32	3	29.8	5	19.5	50.2	573	50	50	10	76	11	63	5.8	10	6	M6	38	47	FF3204-5
FF3205-3	32	5	32	3.5	29.4	3	15.3	34.3	363	50	50	10	82	13	67	7	12	7	M6	38	45	FF3205-3
FF3205-5	32	5	32	3.5	29.4	5	23.8	57.2	592	50	50	10	82	13	67	7	12	7	M6	38	56	FF3205-5
FF3206-3	32	6	32	3.969	29	3	18.3	39.0	377	50	50	10	82	13	67	7	12	7	M6	38	51	FF3206-3
FF3206-5	32	6	32	3.969	29	5	28.4	65.1	615	50	50	10	82	13	67	7	12	7	M6	38	66	FF3206-5
FF3208-3	32	8	32	5	28.3	3	24.8	48.4	398	53	53	10	82	13	67	7	12	7	M6	38	67	FF3208-3
FF3208-5	32	8	32	5	28.3	5	38.5	80.7	649	53	53	10	82	13	67	7	12	7	M6	38	82	FF3208-5
FF3210-3	32	10	32	6.35	26.9	3	32.3	56.5	389	53	53	15	90	15	71	9	15	9	M6	44	76	FF3210-3
FF3210-5	32	10	32	6.35	26.9	5	50.0	94.2	634	53	53	15	90	15	71	9	15	9	M6	44	99	FF3210-5
FF4005-3	40	5	40	3.5	37.4	3	16.9	43.6	423	60	60	10	94	15	75	9	15	9	M6	48	47	FF4005-3
FF4005-5	40	5	40	3.5	37.4	5	26.3	72.7	690	60	60	10	94	15	75	9	15	9	M6	48	58	FF4005-5
FF4006-3	40	6	40	3.969	37	3	20.2	49.3	439	60	60	10	94	15	75	9	15	9	M6	48	53	FF4006-3
FF4006-5	40	6	40	3.969	37	5	31.3	82.1	717	60	60	10	94	15	75	9	15	9	M6	48	68	FF4006-5
FF4008-3	40	8	40	5	36.3	3	27.8	61.9	472	63	63	15	108	18	85	11	18	11	M6	50	67	FF4008-3
FF4008-5	40	8	40	5	36.3	5	43.1	103.2	770	63	63	15	108	18	85	11	18	11	M6	50	87	FF4008-5
FF4010-3	40	10	40	6.35	34.9	3	37.0	73.9	473	63	63	20	108	18	85	11	18	11	M8×1	52	78	FF4010-3
FF4010-5	40	10	40	6.35	34.9	5	57.3	123.1	771	63	63	20	108	18	85	11	18	11	M8×1	52	101	FF4010-5

FF type internal circulation floating ball screw /
FFZ type internal circulation floating ball screw to increase ball diameter pretighten ball screw

Unit: mm

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

2.When axial load F is not equal to $0.3C_a$,

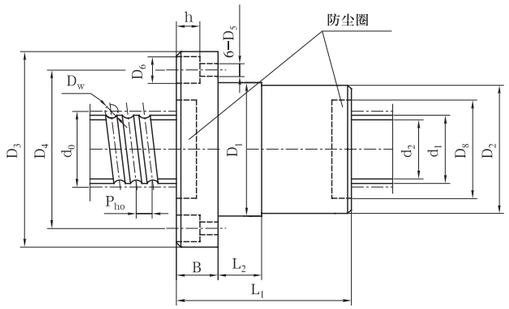
$$K_c = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

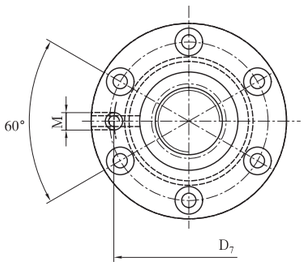
In formula:

Kc is rigidity value shown in Table.

3. Normal working temperature±80°C

4. Please propose special requirements when place the order





Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension													Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2{}^{(-0.1}_{-0.2)}$	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
FF5005-3	50	5	50	3.5	47.4	3	18.7	55.5	485	71	71	10	110	15	90	9	15	9	M8×1	60	47	FF5005-3
FF5005-5	50	5	50	3.5	47.4	5	29	92.5	793	71	71	10	110	15	90	9	15	9	M8×1	60	58	FF5005-5
FF5006-3	50	6	50	3.969	47	3	22.3	62.9	508	71	71	15	110	15	90	9	15	9	M8×1	60	53	FF5006-3
FF5006-5	50	6	50	3.969	47	5	34.6	104.8	830	71	71	15	110	15	90	9	15	9	M8×1	60	68	FF5006-5
FF5008-3	50	8	50	5	46.3	3	30.6	78.1	550	75	75	15	118	18	95	11	18	11	M8×1	60	68	FF5008-3
FF5008-5	50	8	50	5	46.3	5	47.5	130.2	898	75	75	15	118	18	95	11	18	11	M8×1	60	84	FF5008-5
FF5010-3	50	10	50	6.35	44.9	3	41.7	95.6	565	75	75	15	118	18	95	11	18	11	M8×1	62	77	FF5010-3
FF5010-5	50	10	50	6.35	44.9	5	64.7	159.3	922	75	75	15	118	18	95	11	18	11	M8×1	62	102	FF5010-5
FF5012-4	50	12	50	6.35	44.9	4	53.3	127.4	758	75	75	20	118	18	95	11	18	11	M8×1	60	104	FF5012-4
FF5012-5	50	12	50	6.35	44.9	5	64.6	159.2	938	75	75	20	118	18	95	11	18	11	M8×1	60	123	FF5012-5
FF6308-4	63	8	63	4.763	59.1	4	40.6	127.2	844	90	90	20	132	18	110	11	18	11	M8×1	75	76	FF6308-4
FF6308-5	63	8	63	4.763	59.1	5	49.2	159	1046	90	90	20	132	18	110	11	18	11	M8×1	75	87	FF6308-5
FF6310-4	63	10	63	6.35	57.9	4	59.1	162.4	870	90	90	20	138	22	112	13.5	22	13	M8×1	75	95	FF6310-4
FF6310-5	63	10	63	6.35	57.9	5	71.7	203	1078	90	90	20	138	22	112	13.5	22	13	M8×1	75	107	FF6310-5
FF6312-4	63	12	63	7.938	56.7	4	79.7	199.3	898	90	90	20	138	22	112	13.5	22	13	M8×1	75	105	FF6312-4
FF6312-5	63	12	63	7.938	56.7	5	96.5	249.1	1113	90	90	20	138	22	112	13.5	22	13	M8×1	75	123	FF6312-5
FF6316-4	63	16	63	9.525	55.5	4	100.9	234.6	946	95	95	30	148	28	118	13.5	22	13	M8×1	75	140	FF6316-4
FF6316-5	63	16	63	9.525	55.5	5	122.2	293.2	1172	95	95	30	148	28	118	13.5	22	13	M8×1	75	163	FF6316-5
FF6320-4	63	20	63	9.525	55.5	4	100.6	234.2	961	95	95	40	148	28	118	13.5	22	13	M8×1	75	165	FF6320-4
FF6320-5	63	20	63	9.525	55.5	5	121.9	292.7	1190	95	95	40	148	28	118	13.5	22	13	M8×1	75	189	FF6320-5

FF type internal circulation floating ball screw / FFZ type internal circulation floating ball screw to increase ball diameter pretighten ball screw

Unit: mm

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

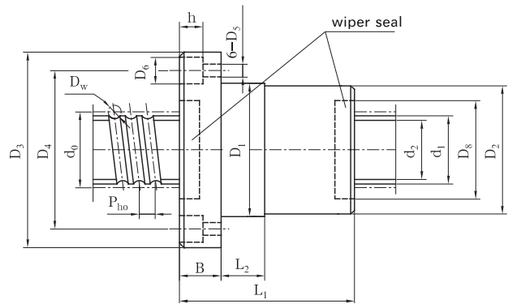
2.When axial load F is not equal to $0.3C_a$,

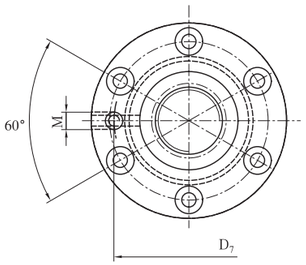
$$K_c = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

In formula:

K is rigidity value shown in Table.

3.The normal working environment temperature for FF type ball screw is ±80℃.





Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_c N/μm	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2(^{0.1}_{0.2})$	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
FF8010-4	80	10	80	6.35	74.9	4	66.7	214.5	1004	105	105	20	156	22	130	13.5	22	13	M8×1	90	95	FF8010-4
FF8010-5	80	10	80	6.35	74.9	5	80.8	268.1	1245	105	105	20	156	22	130	13.5	22	13	M8×1	90	107	FF8010-5
FF8012-4	80	12	80	7.938	73.7	4	90.1	262.7	1074	110	110	25	158	22	132	13.5	22	13	M8×1	90	105	FF8012-4
FF8012-5	80	12	80	7.938	73.7	5	109.1	328.3	1331	110	110	25	158	22	132	13.5	22	13	M8×1	90	123	FF8012-5
FF8016-4	80	16	80	9.525	72.5	4	112.3	300.1	1127	118	118	30	168	28	140	13.5	22	13	M8×1	95	145	FF8016-4
FF8016-5	80	16	80	9.525	72.5	5	136.1	375.2	1396	118	118	30	168	28	140	13.5	22	13	M8×1	95	165	FF8016-5
FF8020-4	80	20	80	9.525	72.5	4	112.2	299.8	1151	118	118	40	168	28	140	13.5	22	13	M10×1	95	166	FF8020-4
FF8020-5	80	20	80	9.525	72.5	5	135.9	374.8	1425	118	118	40	168	28	140	13.5	22	13	M10×1	95	194	FF8020-5
FF10016-4	100	16	97	10	89.8	4	131.3	388.6	1304	140	140	40	204	28	170	17.5	28	17	M10×1	115	145	FF10016-4
FF10016-5	100	16	97	10	89.8	5	159.1	485.7	1616	140	140	40	204	28	170	17.5	28	17	M10×1	115	165	FF10016-5
FF10020-4	100	20	97	10	89.8	4	131.2	388.3	1339	140	140	40	204	28	170	17.5	28	17	M10×1	115	170	FF10020-4
FF10020-5	100	20	97	10	89.8	5	158.9	485.3	1658	140	140	40	204	28	170	17.5	28	17	M10×1	115	194	FF10020-5
FF12016-5	120	16	117	10	109.8	5	172.9	593.7	1815	160	160	40	225	28	190	17.5	28	17	M10×1	135	165	FF12016-5
FF12016-7	120	16	117	10	109.8	7	230.9	831.2	2508	160	160	40	225	28	190	17.5	28	17	M10×1	135	205	FF12016-7
FF12020-5	120	20	117	10	109.8	5	172.8	593.4	1877	160	160	40	225	28	190	17.5	28	17	M10×1	135	194	FF12020-5
FF12020-7	120	20	117	10	109.8	7	230.8	830.8	2592	160	160	40	225	28	190	17.5	28	17	M10×1	135	242	FF12020-7

FFB type inner cycle, deflected lead preload flange nut

Unit: mm

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

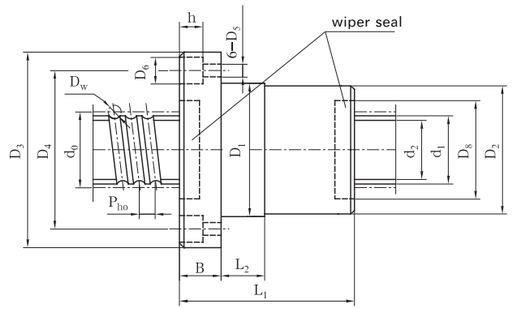
2.When axial load F is not equal to $0.3C_a$,

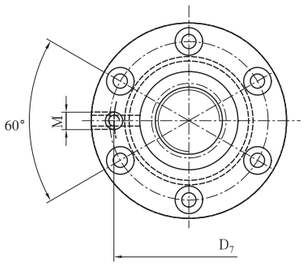
$$K_c = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

In formula:

K is rigidity value shown in Table.

3.The normal working environment temperature for FF type ball screw is ±80℃.





Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2(^{-0.1}_{-0.2})$	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
FFB2004L-2	20	4	20	2.381	18.2	2	5.2	9.8	284	36	36	10	62	11	48	5.8	10	6	M6	25	49	FFB2004L-2
FFB2004L-3	20	4	20	2.381	18.2	3	7.4	14.7	418	36	36	10	62	11	48	5.8	10	6	M6	25	59	FFB2004L-3
FFB2004R-2	20	4	20	3	17.8	2	6.9	11.7	280	36	36	10	62	11	48	5.8	10	6	M6	25	49	FFB2004R-2
FFB2004R-3	20	4	20	3	17.8	3	9.8	17.5	413	36	36	10	62	11	48	5.8	10	6	M6	25	59	FFB2004R-3
FFB2005-2	20	5	20	3.5	17.4	2	8.4	13.2	282	36	36	10	62	11	48	5.8	10	6	M6	25	55	FFB2005-2
FFB2005-3	20	5	20	3.5	17.4	3	11.9	19.8	416	36	36	10	62	11	48	5.8	10	6	M6	25	69	FFB2005-3
FFB2504-2	25	4	25	3	22.8	2	8.0	15.5	346	40	40	10	66	11	53	5.8	10	6	M6	30	49	FFB2504-2
FFB2504-3	25	4	25	3	22.8	3	11.3	23.3	510	40	40	10	66	11	53	5.8	10	6	M6	30	59	FFB2504-3
FFB2505-2	25	5	25	3.5	22.4	2	9.7	17.6	349	40	40	10	66	11	53	5.8	10	6	M6	30	55	FFB2505-2
FFB2505-3	25	5	25	3.5	22.4	3	13.7	26.4	515	40	40	10	66	11	53	5.8	10	6	M6	30	69	FFB2505-3
FFB2506-2	25	6	25	3.969	22	2	11.2	19.3	347	40	40	10	66	11	53	5.8	10	6	M6	30	65	FFB2506-2
FFB2506-3	25	6	25	3.969	22	3	15.8	28.9	511	40	40	10	66	11	53	5.8	10	6	M6	30	80	FFB2506-3
FFB3204-2	32	4	32	3	29.8	2	8.9	20.1	418	50	50	10	76	11	63	5.8	10	6	M6	38	47	FFB3204-2
FFB3204-3	32	4	32	3	29.8	3	12.5	30.1	616	50	50	10	76	11	63	5.8	10	6	M6	38	59	FFB3204-3
FFB3205-2	32	5	32	3.5	29.4	2	10.8	22.9	425	50	50	10	82	13	67	7	12	7	M6	38	57	FFB3205-2
FFB3205-3	32	5	32	3.5	29.4	3	15.3	34.3	626	50	50	10	82	13	67	7	12	7	M6	38	71	FFB3205-3
FFB3206-2	32	6	32	3.969	29	2	12.9	26.0	437	50	50	10	82	13	67	7	12	7	M6	38	65	FFB3206-2
FFB3206-3	32	6	32	3.969	29	3	18.3	39.0	644	50	50	10	82	13	67	7	12	7	M6	38	82	FFB3206-3
FFB3210-2	32	10	32	6.35	26.9	2	22.8	37.7	439	53	53	15	90	15	71	9	15	9	M6	44	96	FFB3210-2
FFB4005-2	40	5	40	3.5	37.4	2	12.0	29.1	505	60	60	10	94	15	75	9	15	9	M6	48	58	FFB4005-2
FFB4005-3	40	5	40	3.5	37.4	3	16.9	43.6	744	60	60	10	94	15	75	9	15	9	M6	48	73	FFB4005-3
FFB4006-2	40	6	40	3.969	37	2	14.2	32.8	518	60	60	10	94	15	75	9	15	9	M6	48	68	FFB4006-2
FFB4006-3	40	6	40	3.969	37	3	20.2	49.3	764	60	60	10	94	15	75	9	15	9	M6	48	84	FFB4006-3
FFB4008-2	40	8	40	5	36.3	2	19.6	41.3	545	63	63	15	108	18	85	11	18	11	M6	50	84	FFB4008-2
FFB4008-3	40	8	40	5	36.3	3	27.8	61.9	803	63	63	15	108	18	85	11	18	11	M6	50	109	FFB4008-3
FFB4010-2	40	10	40	6.35	34.9	2	26.1	49.2	539	63	63	20	108	18	85	11	18	11	M8×1	50	101	FFB4010-2
FFB5005-2	50	5	50	3.5	47.4	2	13.2	37.0	596	71	71	15	110	15	90	9	15	9	M8×1	60	58	FFB5005-2
FFB5005-3	50	5	50	3.5	47.4	3	18.7	55.5	879	71	71	15	110	15	90	9	15	9	M8×1	60	73	FFB5005-3
FFB5006-2	50	6	50	3.969	47	2	15.8	41.9	615	71	71	15	110	15	90	9	15	9	M8×1	60	68	FFB5006-2
FFB5006-3	50	6	50	3.969	47	3	22.3	62.9	907	71	71	15	110	15	90	9	15	9	M8×1	60	84	FFB5006-3
FFB5008-2	50	8	50	5	46.3	2	21.6	52.1	646	75	75	15	118	18	95	11	18	11	M8×1	60	87	FFB5008-2
FFB5008-3	50	8	50	5	46.3	3	30.6	78.1	952	75	75	15	118	18	95	11	18	11	M8×1	60	109	FFB5008-3
FFB5010-2	50	10	50	6.35	44.9	2	29.4	63.7	655	75	75	15	118	18	95	11	18	11	M8×1	62	102	FFB5010-2
FFB5010-3	50	10	50	6.35	44.9	3	41.7	95.6	965	75	75	15	118	18	95	11	18	11	M8×1	62	129	FFB5010-3

FFZD type inner cycle, combined spacer preload nut

Unit: mm

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

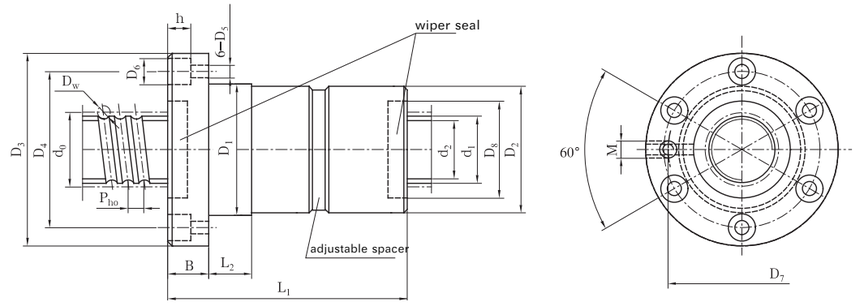
2.When axial load F is not equal to $0.3C_a$,

$$K_c = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

In formula:

K is rigidity value shown in Table.

3.The normal working environment temperature for FF type ball screw is ±80℃.



Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2(^{-0.1}_{-0.2})$	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
FFZD1204-3	12	4	11.3	2.381	9.5	3	5.3	7.3	244	22	22	10	44	8	32	4.8	8.5	4.5	M2.5	16	66	FFZD1204-3
FFZD1604-3	16	4	15.3	2.381	13.5	3	6.7	11.6	349	28	28	10	52	10	38	5.8	10	6	M6	20	69	FFZD1604-3
FFZD1605-3	16	5	15.5	3.5	12.9	3	10.6	15.8	348	28	28	10	52	10	38	5.8	10	6	M6	22	83	FFZD1605-3
FFZD2004L-3	20	4	20	2.381	18.2	3	7.4	14.7	418	36	36	10	62	11	48	5.8	10	6	M6	25	72	FFZD2004L-3
FFZD2004R-3	20	4	20	3	17.8	3	9.8	17.5	413	36	36	10	62	11	48	5.8	10	6	M6	25	72	FFZD2004R-3
FFZD2005-3	20	5	20	3.5	17.4	3	11.9	19.8	416	36	36	10	62	11	48	5.8	10	6	M6	25	83	FFZD2005-3
FFZD2504-3	25	4	25	3	22.8	3	11.3	23.3	510	40	40	10	66	11	53	5.8	10	6	M6	30	74	FFZD2504-3
FFZD2505-3	25	5	25	3.5	22.4	3	13.7	26.4	515	40	40	10	66	11	53	5.8	10	6	M6	30	84	FFZD2505-3
FFZD2506-3	25	6	25	3.969	22	3	15.8	28.9	511	40	40	10	66	11	53	5.8	10	6	M6	30	97	FFZD2506-3
FFZD3204-3	32	4	32	3	29.8	3	12.5	30.1	616	50	50	10	76	11	63	5.8	10	6	M6	38	73	FFZD3204-3
FFZD3204-5	32	4	32	3	29.8	5	19.5	50.2	1004	50	50	10	76	11	63	5.8	10	6	M6	38	92	FFZD3204-5
FFZD3205-3	32	5	32	3.5	29.4	3	15.3	34.3	626	50	50	10	82	13	67	7	12	7	M6	38	85	FFZD3205-3
FFZD3205-5	32	5	32	3.5	29.4	5	23.8	57.2	1021	50	50	10	82	13	67	7	12	7	M6	38	108	FFZD3205-5
FFZD3206-3	32	6	32	3.969	29	3	18.3	39.0	644	50	50	10	82	13	67	7	12	7	M6	38	99	FFZD3206-3
FFZD3206-5	32	6	32	3.969	29	5	28.4	65.1	1050	50	50	10	82	13	67	7	12	7	M6	38	127	FFZD3206-5
FFZD3208-3	32	8	32	5	28.3	3	24.8	48.4	667	53	53	10	82	13	67	7	12	7	M6	42	123	FFZD3208-3
FFZD3208-5	32	8	32	5	28.3	5	38.5	80.7	1087	53	53	10	82	13	67	7	12	7	M6	42	152	FFZD3208-5
FFZD3210-3	32	10	32	6.35	26.9	3	32.3	56.5	646	53	53	15	90	15	71	9	15	9	M6	44	146	FFZD3210-3
FFZD3210-5	32	10	32	6.35	26.9	5	50.0	94.2	1052	53	53	15	90	15	71	9	15	9	M6	44	191	FFZD3210-5
FFZD4005-3	40	5	40	3.5	37.4	3	16.9	43.6	744	60	60	10	94	15	75	9	15	9	M6	48	88	FFZD4005-3
FFZD4005-5	40	5	40	3.5	37.4	5	26.3	72.7	1213	60	60	10	94	15	75	9	15	9	M6	48	111	FFZD4005-5
FFZD4006-3	40	6	40	3.969	37	3	20.2	49.3	764	60	60	10	94	15	75	9	15	9	M6	48	101	FFZD4006-3
FFZD4006-5	40	6	40	3.969	37	5	31.3	82.1	1244	60	60	10	94	15	75	9	15	9	M6	48	128	FFZD4006-5
FFZD4008-3	40	8	40	5	36.3	3	27.8	61.9	803	63	63	15	108	18	85	11	18	11	M6	50	128	FFZD4008-3
FFZD4008-5	40	8	40	5	36.3	5	43.1	103.2	1308	63	63	15	108	18	85	11	18	11	M6	50	163	FFZD4008-5
FFZD4010-3	40	10	40	6.35	34.9	3	37.0	73.9	795	63	63	20	108	18	85	11	18	11	M8×1	52	146	FFZD4010-3
FFZD4010-5	40	10	40	6.35	34.9	5	57.3	123.1	1294	63	63	20	108	18	85	11	18	11	M8×1	52	193	FFZD4010-5

FFZD type inner cycle, combined spacer preload nut

Unit: mm

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

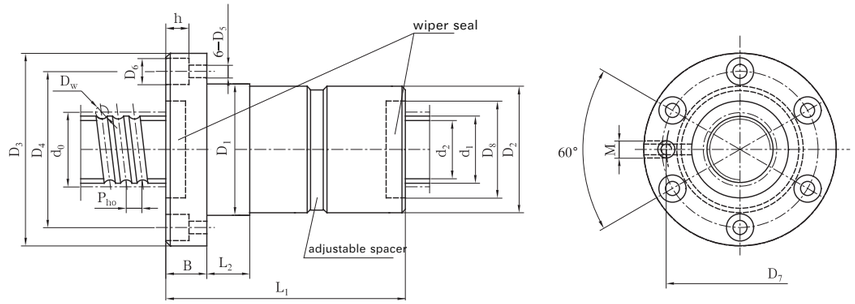
2.When axial load F is not equal to $0.3C_a$,

$$K_C = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

In formula:

K is rigidity value shown in Table.

3.The normal working environment temperature for FF type ball screw is ±80℃.



Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2(^{-0.1}_{-0.2})$	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
FFZD5005-3	50	5	50	3.5	47.4	3	18.7	55.5	879	71	71	10	110	15	90	9	15	9	M8×1	60	87	FFZD5005-3
FFZD5005-5	50	5	50	3.5	47.4	5	29.0	92.5	1434	71	71	10	110	15	90	9	15	9	M8×1	60	111	FFZD5005-5
FFZD5006-3	50	6	50	3.969	47	3	22.3	62.9	907	71	71	15	110	15	90	9	15	9	M8×1	60	101	FFZD5006-3
FFZD5006-5	50	6	50	3.969	47	5	34.6	104.8	1478	71	71	15	110	15	90	9	15	9	M8×1	60	130	FFZD5006-5
FFZD5008-3	50	8	50	5	46.3	3	30.6	78.1	952	75	75	15	118	18	95	11	18	11	M8×1	60	127	FFZD5008-3
FFZD5008-5	50	8	50	5	46.3	5	47.5	130.2	1551	75	75	15	118	18	95	11	18	11	M8×1	60	163	FFZD5008-5
FFZD5010-3	50	10	50	6.35	44.9	3	41.7	95.6	965	75	75	15	118	18	95	11	18	11	M8×1	62	147	FFZD5010-3
FFZD5010-5	50	10	50	6.35	44.9	5	64.7	159.3	1572	75	75	15	118	18	95	11	18	11	M8×1	62	194	FFZD5010-5
FFZD5012-4	50	12	50	6.35	44.9	4	53.3	127.4	1278	75	75	20	118	18	95	11	18	11	M8×1	60	195	FFZD5012-4
FFZD5012-5	50	12	50	6.35	44.9	5	64.6	159.2	1582	75	75	20	118	18	95	11	18	11	M8×1	60	223	FFZD5012-5
FFZD6308-4	63	8	63	4.763	59.1	4	40.6	127.2	1488	90	90	20	132	18	110	11	18	11	M8×1	75	147	FFZD6308-4
FFZD6308-5	63	8	63	4.763	59.1	5	49.2	159	1843	90	90	20	132	18	110	11	18	11	M8×1	75	163	FFZD6308-5
FFZD6310-4	63	10	63	6.35	57.9	4	59.1	162.4	1513	90	90	20	138	22	112	13.5	22	13	M8×1	75	175	FFZD6310-4
FFZD6310-5	63	10	63	6.35	57.9	5	71.7	203	1873	90	90	20	138	22	112	13.5	22	13	M8×1	75	198	FFZD6310-5
FFZD6312-4	63	12	63	7.938	56.7	4	79.7	199.3	1550	90	90	20	138	22	112	13.5	22	13	M8×1	75	203	FFZD6312-4
FFZD6312-5	63	12	63	7.938	56.7	5	96.5	249.1	1919	90	90	20	138	22	112	13.5	22	13	M8×1	75	230	FFZD6312-5
FFZD6316-4	63	16	63	9.525	55.5	4	100.9	234.6	1594	95	95	30	148	28	118	13.5	22	13	M8×1	85	266	FFZD6316-4
FFZD6316-5	63	16	63	9.525	55.5	5	122.2	293.2	1972	95	95	30	148	28	118	13.5	22	13	M8×1	85	306	FFZD6316-5
FFZD6320-4	63	20	63	9.525	55.5	4	100.6	234.2	1601	95	95	40	148	28	118	13.5	22	13	M8×1	75	304	FFZD6320-4
FFZD6320-5	63	20	63	9.525	55.5	5	121.9	292.7	1981	95	95	40	148	28	118	13.5	22	13	M8×1	75	354	FFZD6320-5

FFZD type inner cycle, combined spacer preload nut

Unit: mm

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

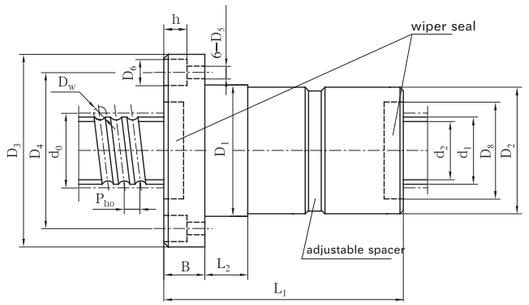
2.When axial load F is not equal to $0.3C_a$,

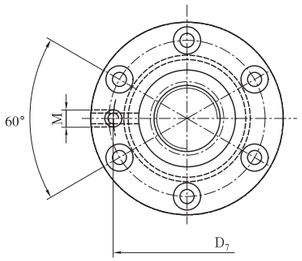
$$K_C = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

In formula:

K is rigidity value shown in Table.

3.The normal working environment temperature for FF type ball screw is ±80℃.





Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												规格代号
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	$D_2{}^{(-0.1)}_{(-0.3)}$	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
FFZD8010-4	80	10	80	6.35	74.9	4	66.7	214.5	1824	105	105	20	156	22	130	13.5	22	13	M8×1	90	181	FFZD8010-4
FFZD8010-5	80	10	80	6.35	74.9	5	80.8	268.1	2258	105	105	20	156	22	130	13.5	22	13	M8×1	90	204	FFZD8010-5
FFZD8012-4	80	12	80	7.938	73.7	4	90.1	262.7	1897	110	110	25	158	22	132	13.5	22	13	M8×1	90	211	FFZD8012-4
FFZD8012-5	80	12	80	7.938	73.7	5	109.1	328.3	2348	110	110	25	158	22	132	13.5	22	13	M8×1	90	237	FFZD8012-5
FFZD8016-4	80	16	80	9.525	72.5	4	112.3	300.1	1919	118	118	30	168	28	140	13.5	22	13	M8×1	95	274	FFZD8016-4
FFZD8016-5	80	16	80	9.525	72.5	5	136.1	375.2	2375	118	118	30	168	28	140	13.5	22	13	M8×1	95	298	FFZD8016-5
FFZD8020-4	80	20	80	9.525	72.5	4	112.2	299.8	1934	118	118	40	168	28	140	13.5	22	13	M10×1	95	306	FFZD8020-4
FFZD8020-5	80	20	80	9.525	72.5	5	135.9	374.8	2393	118	118	40	168	28	140	13.5	22	13	M10×1	95	358	FFZD8020-5
FFZD10016-4	100	16	97	10	89.8	4	131.3	388.6	2254	140	140	40	204	28	170	17.5	28	17	M10×1	115	263	FFZD10016-4
FFZD10016-5	100	16	97	10	89.8	5	159.1	485.7	2790	140	140	40	204	28	170	17.5	28	17	M10×1	115	300	FFZD10016-5
FFZD10020-4	100	20	97	10	89.8	4	131.2	388.3	2278	140	140	40	204	28	170	17.5	28	17	M10×1	115	315	FFZD10020-4
FFZD10020-5	100	20	97	10	89.8	5	158.9	485.3	2819	140	140	40	204	28	170	17.5	28	17	M10×1	115	372	FFZD10020-5
FFZD12016-5	120	16	117	10	109.8	5	172.9	593.7	3209	160	160	40	225	28	190	17.5	28	17	M10×1	135	300	FFZD12016-5
FFZD12016-7	120	16	117	10	109.8	7	230.9	831.2	4428	160	160	40	225	28	190	17.5	28	17	M10×1	135	380	FFZD12016-7
FFZD12020-5	120	20	117	10	109.8	5	172.8	593.4	3255	160	160	40	225	28	190	17.5	28	17	M10×1	135	370	FFZD12020-5
FFZD12020-7	120	20	117	10	109.8	7	230.8	830.8	4490	160	160	40	225	28	190	17.5	28	17	M10×1	135	466	FFZD12020-7

Ball screw with FFZL type inner cycle, thread preload nut

Unit: mm

Notes:

1.K_c is theoretical calculation value when preload F_p is $0.1C_a$ and axial load F is $0.3C_a$.

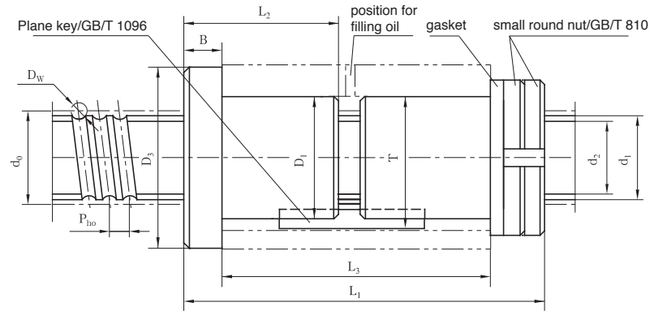
2.When axial load F is not equal to $0.3C_a$,

$$K_c = K\left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

In formula:

K is rigidity value shown in Table.

3.The normal working environment temperature for FF type ball screw is ±80℃.



Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension							Small round nut GB/T 810	Plane key GB/T 1096	Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(h6)	D_3	L_1	L_2	L_3	B	T			
FFZL2004L-3	20	4	20	2.381	18.2	3	7.4	14.7	412	30	45	70	28	44	6	32	M30×1.5	4×4×28	FFZL2004L-3
FFZL2004R-3	20	4	20	3	17.8	3	9.8	17.5	406	30	45	70	28	44	6	32	M30×1.5	4×4×28	FFZL2004R-3
FFZL2005-3	20	5	20	3.5	17.4	3	11.9	19.8	414	34	48	81	34	55	6	36.5	M33×1.5	5×5×40	FFZL2005-3
FFZL2505-3	25	5	25	3.5	22.4	3	13.7	26.4	517	42	58	84	34.5	55	8	44.5	M42×1.5	5×5×40	FFZL2505-3
FFZL2506-3	25	6	25	3.969	22	3	15.8	28.9	515	45	62	95	41	66	8	48	M45×1.5	6×6×45	FFZL2506-3
FFZL3205-3	32	5	32	3.5	29.4	3	15.3	34.3	626	50	68	88	37	55	8	52.5	M48×1.5	5×5×40	FFZL3205-3
FFZL3206-3	32	6	32	3.969	29	3	18.3	39.0	644	50	68	99	41	66	8	53	M48×1.5	6×6×45	FFZL3206-3
FFZL4006-3	40	6	40	3.969	37	3	20.2	49.3	764	60	80	101	42	66	10	63	M60×2	6×6×45	FFZL4006-3
FFZL4008-3	40	8	40	5	36.3	3	27.8	61.9	798	60	80	119	52	84	10	63	M60×2	8×7×55	FFZL4008-3
FFZL4010-3	40	10	40	6.35	34.9	3	37.0	73.9	797	65	85	140	62	102	13	68	M64×2	6×6×60	FFZL4010-3
FFZL5006-4	50	6	50	3.969	47	4	28.6	83.8	1197	72	95	117	50	78	10	75.5	M72×2	8×7×55	FFZL5006-4
FFZL5008-4	50	8	50	5	46.3	4	39.2	104.2	1253	75	95	144	64	102	12	79	M72×2	12×8×80	FFZL5008-4
FFZL5010-4	50	10	50	6.35	44.9	4	53.4	127.5	1270	75	95	167	76	124	13	79	M72×2	12×8×100	FFZL5010-4
FFZL5012-4	50	12	50	6.35	44.9	4	53.3	127.4	1278	75	95	191	89	146	15	79	M72×2	12×8×110	FFZL5012-4
FFZL6308-4	63	8	63	4.763	59.1	4	40.6	127.2	1469	85	110	144	64	102	12	89	M85×2	12×8×80	FFZL6308-4
FFZL6310-4	63	10	63	6.35	57.9	4	59.1	162.4	1513	90	115	168	77	124	14	95	M90×2	16×10×100	FFZL6310-4
FFZL6312-4	63	12	63	7.938	56.7	4	79.7	199.3	1550	90	115	195	90	150	15	95	M90×2	16×10×110	FFZL6312-4
FFZL8010-4	80	10	80	6.35	74.9	4	66.7	214.5	1850	110	135	180	79	127	15	116	M110×2	20×12×110	FFZL8010-4
FFZL8012-4	80	12	80	7.938	73.7	4	90.1	262.7	1897	110	135	204	91	150	16	116	M110×2	20×12×110	FFZL8012-4

NF internal circulation fixed ball screw
NFZ internal cycle fixed preload ball screw with increased ball diameter

Unit: mm

Note:

1) K_c is the theoretical calculated value when the preload F_p is 0.1Ca and the axial load F is $0.3C_a$;

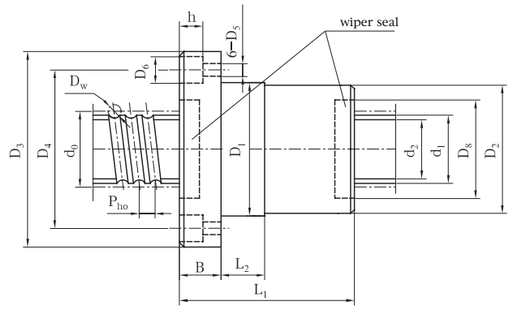
2) When the axial load F is not equal to $0.3C_a$,

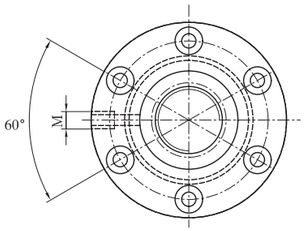
$$K'_c = K_c \left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

K_c is the stiffness value in the table;

3) Normal working ambient temperature range ±80℃;

4) Special requests should be made at the time of ordering.





Code and spec.	Nominal dia. d_o	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Rigidity K_C N/μm	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a KN	Static load C_{oa} KN		D_1(g6)	D2($^{0}_{-0.3}$)	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
NF1605-3	16	5	16	3.5	13.4	3	10.6	15.8	209	28	28	10	52	10	38	5.8	10	6	M6	22	42	NF1605-3
NF2005-3	20	5	20	3.5	17.4	3	11.9	19.8	250	36	36	10	62	11	48	5.8	10	6	M6	25	43	NF2005-3
NF2505-3	25	5	25	3.5	22.4	3	13.7	26.4	302	40	40	10	66	11	53	5.8	10	6	M6	30	43	NF2505-3
NF2510-4	25	10	25	3.969	21.7	4	20.2	38.3	412	40	40	15	66	11	53	5.8	10	6	M6	30	80	NF2510-4
NF3205-3	32	5	32	3.5	29.4	3	15.3	34.3	363	50	50	10	82	13	67	7	12	7	M6	38	45	NF3205-3
NF3205-5	32	5	32	3.5	29.4	5	23.8	57.2	592	50	50	10	82	13	67	7	12	7	M6	38	56	NF3205-5
NF3210-3	32	10	32	6.35	26.9	3	32.3	56.5	389	53	53	15	90	15	71	9	15	9	M6	44	76	NF3210-3
NF3210-5	32	10	32	6.35	26.9	5	50	94.2	634	53	53	15	90	15	71	9	15	9	M6	44	99	NF3210-5
NF4005-3	40	5	40	3.5	37.4	3	16.9	43.6	423	60	60	10	94	15	75	9	15	9	M6	48	47	NF4005-3
NF4005-5	40	5	40	3.5	37.4	5	26.3	72.7	690	60	60	10	94	15	75	9	15	9	M6	48	58	NF4005-5
NF4008-3	40	8	40	5	36.3	3	27.8	61.9	472	63	63	15	108	18	85	11	18	11	M6	50	67	NF4008-3
NF4008-5	40	8	40	5	36.3	5	43.1	103.2	770	63	63	15	108	18	85	11	18	11	M6	50	87	NF4008-5
NF4010-3	40	10	40	6.35	34.9	3	37	73.9	473	63	63	20	108	18	85	11	18	11	M8×1	52	78	NF4010-3
NF4010-5	40	10	40	6.35	34.9	5	57.3	123.1	771	63	63	20	108	18	85	11	18	11	M8×1	52	101	NF4010-5
NF5005-3	50	5	50	3.5	47.4	3	18.7	55.5	485	71	71	10	110	15	90	9	15	9	M8×1	60	47	NF5005-3
NF5005-5	50	5	50	3.5	47.4	5	29	92.5	793	71	71	10	110	15	90	9	15	9	M8×1	60	58	NF5005-5
NF5010-3	50	10	50	6.35	44.9	3	41.7	95.6	565	75	75	15	118	18	95	11	18	11	M8×1	62	77	NF5010-3
NF5010-5	50	10	50	6.35	44.9	5	64.7	159.3	922	75	75	15	118	18	95	11	18	11	M8×1	62	102	NF5010-5
NF6310-4	63	10	63	6.35	57.9	4	59.1	162.4	870	90	90	20	138	22	112	13.5	22	13	M8×1	75	95	NF6310-4
NF6310-5	63	10	63	6.35	57.9	5	71.7	203	1078	90	90	20	138	22	112	13.5	22	13	M8×1	75	107	NF6310-5
NF6316-4	63	16	63	12.7	53.9	4	188.6	419	1164	95	95	30	148	28	118	13.5	22	13	M8×1	75	140	NF6316-4
NF6316-5	63	16	63	12.7	53.9	5	228.5	523.7	1442	95	95	30	148	28	118	13.5	22	13	M8×1	75	163	NF6316-5
NF6320-4	63	20	63	9.525	55.5	4	100.6	234.2	961	95	95	40	148	28	118	13.5	22	13	M8×1	75	165	NF6320-4
NF6320-5	63	20	63	9.525	55.5	5	121.9	292.7	1190	95	95	40	148	28	118	13.5	22	13	M8×1	75	189	NF6320-5
NF6320-4	63	20	63	12.7	53.9	4	188.2	418.3	1193	95	95	40	148	28	118	13.5	22	13	M8×1	75	165	NF6320-4
NF6320-5	63	20	63	12.7	53.9	5	228	522.8	1478	95	95	40	148	28	118	13.5	22	13	M8×1	75	189	NF6320-5
NF8012-4	80	12	80	7.938	73.7	4	90.1	262.7	1074	110	110	25	158	22	132	13.5	22	13	M8×1	90	105	NF8012-4
NF8012-5	80	12	80	7.938	73.7	5	109.1	328.3	1331	110	110	25	158	22	132	13.5	22	13	M8×1	90	123	NF8012-5
NF8020-4	80	20	80	9.525	72.5	4	112.2	299.8	1151	118	118	40	168	28	140	13.5	22	13	M10×1	95	166	NF8020-4
NF8020-5	80	20	80	9.525	72.5	5	135.9	374.8	1425	118	118	40	168	28	140	13.5	22	13	M10×1	95	194	NF8020-5

NFZD internal cycle fixed gasket preload ball screw

Unit: mm

Note:

1) Kc is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3Ca;

2) When the axial load F is not equal to 0.3Ca,

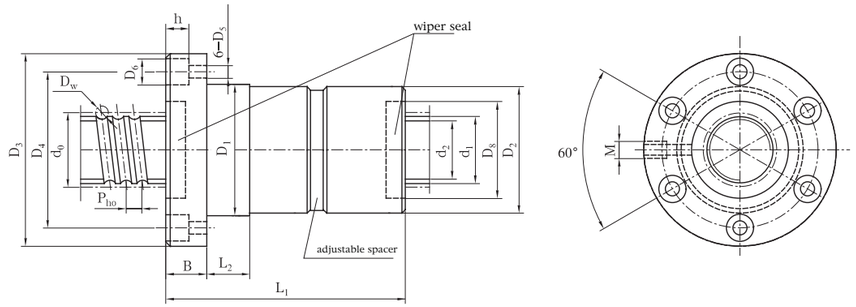
$$K_c' = K_c \left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

Where Kc is the stiffness value in the table;

3) This type of ball screw is suitable for medium and low speed applications;

4) Normal working ambient temperature range ±80℃;

5) Any special request should be made at the time of ordering.



Code and spec.	Nominal dia. d_0	Basic lead P_{h0}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Stiffness K_c N/um	Mounting & connecting dimension												Code and spec.
							Dynamic load C_a kN	Static load C_{0a} kN		D_1(g6)	$D2(^{-0.1}_{-0.3})$	L_2	D_3	B	D_4	D_5	D_6	h	M	D_8	L_1	
NFZD1605-3	16	5	16	3.5	13.4	3	10.6	15.8	348	28	28	10	52	10	38	5.8	10	6	M6	22	83	NFZD1605-3
NFZD2005-3	20	5	20	3.5	17.4	3	11.9	19.8	416	36	36	10	62	11	48	5.8	10	6	M6	25	83	NFZD2005-3
NFZD2505-3	25	5	25	3.5	22.4	3	13.7	26.4	515	40	40	10	66	11	53	5.8	10	6	M6	30	84	NFZD2505-3
NFZD2510-4	25	10	25	3.969	21.7	4	20.2	38.3	678	40	40	15	66	11	53	5.8	10	6	M6	30	148	NFZD2510-4
NFZD3205-3	32	5	32	3.5	29.4	3	15.3	34.3	626	50	50	10	82	13	67	7	12	7	M6	38	85	NFZD3205-3
NFZD3205-5	32	5	32	3.5	29.4	5	23.8	57.2	1021	50	50	10	82	13	67	7	12	7	M6	38	108	NFZD3205-5
NFZD3210-3	32	10	32	6.35	26.9	3	32.3	56.5	646	53	53	15	90	15	71	9	15	9	M6	44	146	NFZD3210-3
NFZD3210-5	32	10	32	6.35	26.9	5	50	94.2	1052	53	53	15	90	15	71	9	15	9	M6	44	191	NFZD3210-5
NFZD4005-3	40	5	40	3.5	37.4	3	16.9	43.6	744	60	60	10	94	15	75	9	15	9	M6	48	88	NFZD4005-3
NFZD4005-5	40	5	40	3.5	37.4	5	26.3	72.7	1213	60	60	10	94	15	75	9	15	9	M6	48	111	NFZD4005-5
NFZD4008-3	40	8	40	5	36.3	3	27.8	61.9	803	63	63	15	108	18	85	11	18	11	M6	50	128	NFZD4008-3
NFZD4008-5	40	8	40	5	36.3	5	43.1	103.2	1308	63	63	15	108	18	85	11	18	11	M6	50	163	NFZD4008-5
NFZD4010-3	40	10	40	6.35	34.9	3	37	73.9	795	63	63	20	108	18	85	11	18	11	M8×1	52	146	NFZD4010-3
NFZD4010-5	40	10	40	6.35	34.9	5	57.3	123.1	1294	63	63	20	108	18	85	11	18	11	M8×1	52	193	NFZD4010-5
NFZD5005-3	50	5	50	3.5	47.4	3	18.7	55.5	879	71	71	10	110	15	90	9	15	9	M8×1	60	87	NFZD5005-3
NFZD5005-5	50	5	50	3.5	47.4	5	29	92.5	1434	71	71	10	110	15	90	9	15	9	M8×1	60	111	NFZD5005-5
NFZD5010-3	50	10	50	6.35	44.9	3	41.7	95.6	965	75	75	15	118	18	95	11	18	11	M8×1	62	147	NFZD5010-3
NFZD5010-5	50	10	50	6.35	44.9	5	64.7	159.3	1572	75	75	15	118	18	95	11	18	11	M8×1	62	194	NFZD5010-5
NFZD6310-4	63	10	63	6.35	57.9	4	59.1	162.4	1513	90	90	20	138	22	112	13.5	22	13	M8×1	75	175	NFZD6310-4
NFZD6310-5	63	10	63	6.35	57.9	5	71.7	203	1873	90	90	20	138	22	112	13.5	22	13	M8×1	75	198	NFZD6310-5
NFZD6316-4	63	16	63	12.7	53.9	4	188.6	419	2014	95	95	30	148	28	118	13.5	22	13	M8×1	75	266	NFZD6316-4
NFZD6316-5	63	16	63	12.7	53.9	5	228.5	523.7	2494	95	95	30	148	28	118	13.5	22	13	M8×1	75	306	NFZD6316-5
NFZD6320-4	63	20	63	9.525	55.5	4	100.6	234.2	1601	95	95	40	148	28	118	13.5	22	13	M8×1	75	304	NFZD6320-4
NFZD6320-5	63	20	63	9.525	55.5	5	121.9	292.7	1981	95	95	40	148	28	118	13.5	22	13	M8×1	75	354	NFZD6320-5
NFZD6320-4	63	20	63	12.7	53.9	4	188.2	418.3	2032	95	95	40	148	28	118	13.5	22	13	M8×1	75	304	NFZD6320-4
NFZD6320-5	63	20	63	12.7	53.9	5	228	522.8	2515	95	95	40	148	28	118	13.5	22	13	M8×1	75	354	NFZD6320-5
NFZD8012-4	80	12	80	7.938	73.7	4	90.1	262.7	1897	110	110	25	158	22	132	13.5	22	13	M8×1	90	211	NFZD8012-4
NFZD8012-5	80	12	80	7.938	73.7	5	109.1	328.3	2348	110	110	25	158	22	132	13.5	22	13	M8×1	90	237	NFZD8012-5
NFZD8020-4	80	20	80	9.525	72.5	4	112.2	299.8	1934	118	118	40	168	28	140	13.5	22	13	M10×1	95	306	NFZD8020-4
NFZD8020-5	80	20	80	9.525	72.5	5	135.9	374.8	2393	118	118	40	168	28	140	13.5	22	13	M10×1	95	358	NFZD8020-5

Single side: CTF high load drive ball screw

Unit: mm

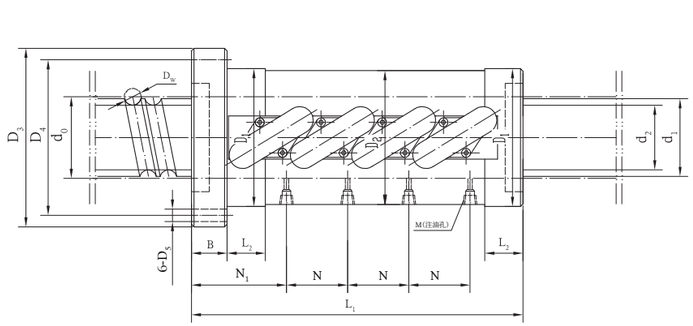
Note:

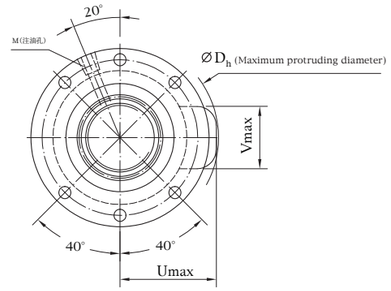
1) K_c is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3C_a;

2) When the axial load F is not equal to 0.3C_a,

$$K'_c = K_c \left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

K_c is the stiffness value in the table;





Code and spec.	Nominal dia. d_0	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load (kN)		Stiffness K_c N/μm	Nut mounting connection dimensions															Code and spec.
							Dynamic load C_a kN	Static load C_{oa} kN		D_1(g6)	D2($^{-0.1}_{-0.2}$)	D_h	D_3	B	D_4	D_5	U	V	L_1	L_2	N_1	N	M	
CTF5014-2.5×2	50	14	50	9.525	42	2.5×2	172.6	448.9	3415	80	80	114	114	28	97	9	55	46	146	30	69	42	M6	CTF5014-2.5×2
CTF5014-2.5×3	50	14	50	9.525	42	2.5×3	244.6	673.4	5028	80	80	114	114	28	97	9	55	46	188	30	69	42	M6	CTF5014-2.5×3
CTF5016-2.5×2	50	16	50	12.7	39	2.5×2	249.5	575.7	3479	95	95	130	129	28	112	9	65	50	164	30	77.5	48	Rc1/8	CTF5016-2.5×2
CTF5016-2.5×3	50	16	50	12.7	39	2.5×3	353.5	863.6	5122	95	95	130	129	28	112	9	65	50	212	30	77.5	48	Rc1/8	CTF5016-2.5×3
CTF6316-2.5×2	63	16	63	12.7	52	2.5×2	283.1	748.4	4262	105	105	145	139	28	122	9	72	50	164	30	77.5	48	Rc1/8	CTF6316-2.5×2
CTF6316-2.5×3	63	16	63	12.7	52	2.5×3	401.3	1122.6	6276	105	105	145	139	28	122	9	72	50	212	30	77.5	48	Rc1/8	CTF6316-2.5×3
CTF6316-2.5×4	63	16	63	12.7	52	2.5×4	513.9	1496.8	8259	105	105	145	139	28	122	9	72	50	260	30	77.5	48	Rc1/8	CTF6316-2.5×4
CTF6316-3.5×2	63	16	63	12.7	52	3.5×2	378.1	1047.8	5876	105	105	145	139	28	122	9	72	50	199	30	77.5	64	Rc1/8	CTF6316-3.5×2
CTF6316-3.5×3	63	16	63	12.7	52	3.5×3	535.9	1571.6	8652	105	105	145	139	28	122	9	72	50	263	30	77.5	64	Rc1/8	CTF6316-3.5×3
CTF6320-2.5×2	63	20	63	15.875	49	2.5×2	382.2	936.1	4432	117	117	160	157	32	137	11	78	64	199	30	90	80	Rc1/8	CTF6320-2.5×2
CTF6320-2.5×3	63	20	63	15.875	49	2.5×3	541.7	1404.2	6525	117	117	160	157	32	137	11	78	64	259	30	90	80	Rc1/8	CTF6320-2.5×3
CTF8016-2.5×2	80	16	80	12.7	69	2.5×2	312.5	947	5074	120	120	160	154	32	137	9	78	62	170	40	81.5	48	Rc1/8	CTF8016-2.5×2
CTF8016-2.5×3	80	16	80	12.7	69	2.5×3	442.9	1420.5	7473	120	120	160	154	32	137	9	78	62	218	40	81.5	48	Rc1/8	CTF8016-2.5×3
CTF8016-2.5×4	80	16	80	12.7	69	2.5×4	567.3	1894	9835	120	120	160	154	32	137	9	78	62	266	40	81.5	48	Rc1/8	CTF8016-2.5×4
CTF8016-3.5×2	80	16	80	12.7	69	3.5×2	417.4	1325.8	6997	120	120	160	154	32	137	9	78	62	201	40	81.5	64	Rc1/8	CTF8016-3.5×2
CTF8016-3.5×3	80	16	80	12.7	69	3.5×3	591.6	1988.7	10304	120	120	160	154	32	137	9	78	62	265	40	81.5	64	Rc1/8	CTF8016-3.5×3
CTF8016-3.5×4	80	16	80	12.7	69	3.5×4	757.6	2651.7	13561	120	120	160	154	32	137	9	78	62	329	40	81.5	64	Rc1/8	CTF8016-3.5×4
CTF8020-3.5×2	80	20	80	15.875	66	3.5×2	563.4	1638.6	7226	130	130	180	170	32	150	11	88	64	239	40	90	80	Rc1/8	CTF8020-3.5×2
CTF8020-3.5×3	80	20	80	15.875	66	3.5×3	798.4	2457.9	10641	130	130	180	170	32	150	11	88	64	319	40	90	80	Rc1/8	CTF8020-3.5×3
CTF10016-3.5×2	100	16	100	12.7	89	3.5×2	459.2	1672	8328	145	145	185	185	32	165	11	90	68	201	40	81.5	64	Rc1/8	CTF10016-3.5×2
CTF10016-3.5×3	100	16	100	12.7	89	3.5×3	650.7	2508	12266	145	145	185	185	32	165	11	90	68	265	40	81.5	64	Rc1/8	CTF10016-3.5×3
CTF10016-3.5×4	100	16	100	12.7	89	3.5×4	833.4	3344	16145	145	145	185	185	32	165	11	90	68	329	40	81.5	64	Rc1/8	CTF10016-3.5×4

Double side: CTF type all-electric injection molding machine with high load drive ball screw

Unit: mm

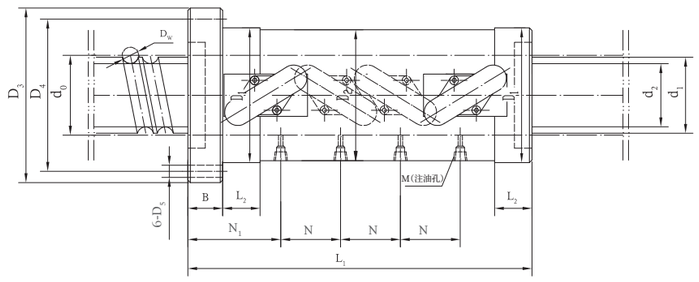
Note:

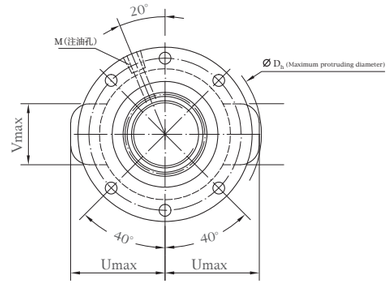
1) K_c is the theoretical calculated value when the preload Fp is 0.1Ca and the axial load F is 0.3C_a;

2) When the axial load F is not equal to 0.3C_a,

$$K'_c = K_c \left(\frac{F}{0.3C_a}\right)^{\frac{1}{3}}$$

K_c is the stiffness value in the table;





Code and spec.	Nominal dia.d_0	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load (kN)		Stiffness K_c N/μm	Nut mounting connection dimensions															Code and spec.
							Dynamic load C_a kN	Static load C_{oa} kN		D_1(g6)	D2($^{-0.1}_{-0.2}$)	D_n	D_3	B	D_4	D_5	U	V	L_1	L_2	N_1	N	M	
CTF5014-2.5×3	50	14	50	9.525	42	2.5×3	244.6	673.4	5028	80	80	114	114	28	97	9	55	46	202	30	69	42	M6	CTF5014-2.5×3
CTF5016-2.5×3	50	16	50	12.7	39	2.5×3	353.5	863.6	5122	95	95	130	129	28	112	9	65	50	228	30	77.5	48	Rc1/8	CTF5016-2.5×3
CTF6316-2.5×3	63	16	63	12.7	52	2.5×3	401.3	1122.6	6276	105	105	145	139	28	122	9	72	50	228	30	77.5	48	Rc1/8	CTF6316-2.5×3
CTF6316-2.5×4	63	16	63	12.7	52	2.5×4	513.9	1496.8	8259	105	105	145	139	28	122	9	72	50	276	30	77.5	48	Rc1/8	CTF6316-2.5×4
CTF6316-3.5×3	63	16	63	12.7	52	3.5×3	535.9	1571.6	8652	105	105	145	139	28	122	9	72	50	279	30	77.5	64	Rc1/8	CTF6316-3.5×3
CTF6320-2.5×3	63	20	63	15.875	49	2.5×3	541.7	1404.2	6525	117	117	160	157	32	137	11	78	64	279	30	90	80	Rc1/8	CTF6320-2.5×3
CTF8016-2.5×3	80	16	80	12.7	69	2.5×3	442.9	1420.5	7473	120	120	160	154	32	137	9	78	62	234	40	81.5	48	Rc1/8	CTF8016-2.5×3
CTF8016-2.5×4	80	16	80	12.7	69	2.5×4	567.3	1894	9835	120	120	160	154	32	137	9	78	62	282	40	81.5	48	Rc1/8	CTF8016-2.5×4
CTF8016-3.5×3	80	16	80	12.7	69	3.5×3	591.6	1988.7	10304	120	120	160	154	32	137	9	78	62	281	40	81.5	64	Rc1/8	CTF8016-3.5×3
CTF8016-3.5×4	80	16	80	12.7	69	3.5×4	757.6	2651.7	13561	120	120	160	154	32	137	9	78	62	345	40	81.5	64	Rc1/8	CTF8016-3.5×4
CTF8020-3.5×3	80	20	80	15.875	66	3.5×3	798.4	2457.9	10641	130	130	180	170	32	150	11	88	64	339	40	90	80	Rc1/8	CTF8020-3.5×3
CTF10016-3.5×3	100	16	100	12.7	89	3.5×3	650.7	2508	12266	145	145	185	185	32	165	11	90	68	281	40	81.5	64	Rc1/8	CTF10016-3.5×3
CTF10016-3.5×4	100	16	100	12.7	89	3.5×4	833.4	3344	16145	145	145	185	185	32	165	11	90	68	345	40	81.5	64	Rc1/8	CTF10016-3.5×4

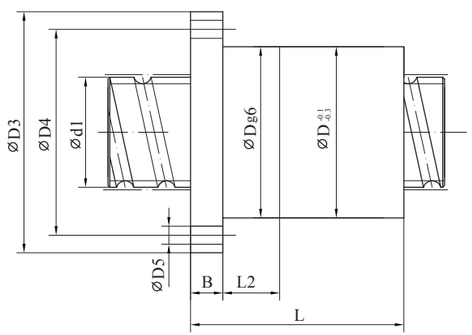
Ball screw for electric cylinder

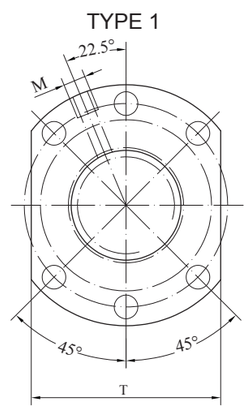
The electric cylinder is a drive device that converts the rotary motion of the motor into linear motion. It is widely used in the occasions of replacing hydraulic and pneumatic propulsion. It has the advantages of high positioning accuracy, compact structure, easy installation, etc. It plays an important role in the fields of military industry, photovoltaic industry and industrial automation.As the core part of the electric cylinder, ball screw pair has the advantages of high transmission efficiency, large rated dynamic load, high positioning accuracy, compact structure, etc., and is the core transmission part of the electric cylinder.

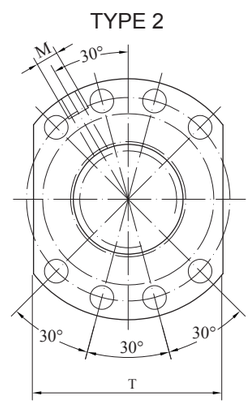
Ball screw for electric cylinder

Unit: mm

Note:
1, the nut with dust ring
2. The nut has an oil injection hole
3, the list is the preferred size of the electric cylinder nut





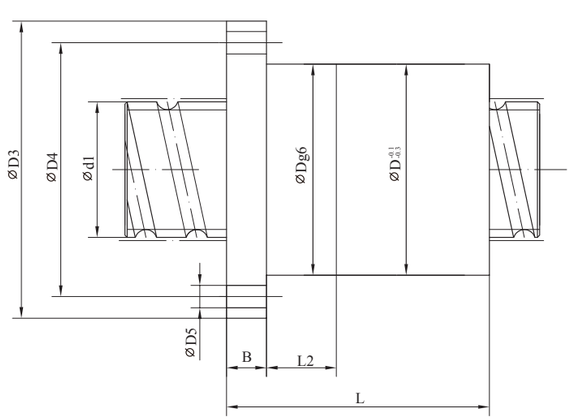


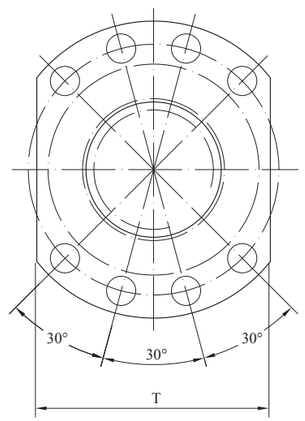
Code and spec.	Nominal dia. d_0	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia. of ball screw d_2	Number of circles n	Basic rated load		Stiffness K_c N/μm	Fit outer circle D	L_2	Flange outer circle D_3	Flange thickness B	Total nut length L	Center distance of mounting holes D_4	TYPE	Edging width T	Mounting hole diameter D_5	Oil hole M	Code and spec.
							Dynamic load C_a kN	Static load C_{oa}kN												
NF1605-4	16	5	16	3.5	13.4	4	13.6	21.1	276	28	10	48	10	45	38		40	5.5	M6	NF1605-4
NF2510-4	25	10	25	3.969	21.7	4	20.2	38.3	412	40	15	62	12	80	51	1	48	6.6	M6	NF2510-4
NF3210-4	32	10	32	6.35	26.9	4	41.3	75.4	512	50	15	79	12	85	65		62	9	M6	NF3210-4
NF4010-4	40	10	40	6.35	34.9	4	47.3	98.5	622	63	18	93	14	88	78	2	70	9	M8X1	NF4010-4

Heavy on the electric cylinder with ball screw

Unit: mm

Note:
1. The nut does not have a dust ring
2. The nut does not have an oil injection hole
3, the list is the preferred size of the electric cylinder nut





Code and spec.	Nominal dia. d_0	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia. D_w	Bottom dia.of ball screw d_2	Number of circles n	Basic rated load		Stiffness K_c N/μm	Nut mounting connection dimensions								Code and spec.
							Dynamic load C_a kN	Static load C_{oa}kN		Fit outer circle D	L_2	Flange outer circle D_3	Flange thickness B	Total nut length L	Center distance of mounting holes D_4	Edging width T	Mounting hole diameter D_5	
JF5010-8	50	10	50	7.144	44.9	8	104.1	251.2	1314	75	15	109	16	94	93	85	11	JF5010-8
JF5020-7	50	20	50	7.144	44.9	7	95.5	230.7	1266	75	15	109	16	154	93	85	11	JF5020-7
JF6320-6	63	20	63	9.525	55.6	6	137.6	332.8	1392	95	25	135	20	140	115	100	13.5	JF6320-6
JF6320-8	63	20	63	12.7	54	8	325.1	776.8	2286	100	25	139	28	184	120	105	13.5	JF6320-8
JF8020-8	80	20	80	12.7	70.9	8	401.0	1212.1	4020	125	30	169	28	182	150	128	13.5	JF8020-8
JF10020-8	100	20	97	12.7	87.9	8	444.9	1526.9	4795	150	40	207	32	184	180	152	17.5	JF10020-8
JF10025-8	100	25	97	15.875	85.7	8	603.3	1891.2	4956	150	40	207	32	227	180	152	17.5	JF10025-8

Rolling lead screw

Rolling lead screw is produced by rolling teeth, compared with the traditional trapezoidal lead screw pair transmission mode, rolling lead screw pair can improve the smoothness of operation, reduce axial backlash and friction, improve transmission efficiency and other advantages.Compared with grinding lead screw pairs, rolled lead screw pairs have the advantages of rapid supply and affordable prices.

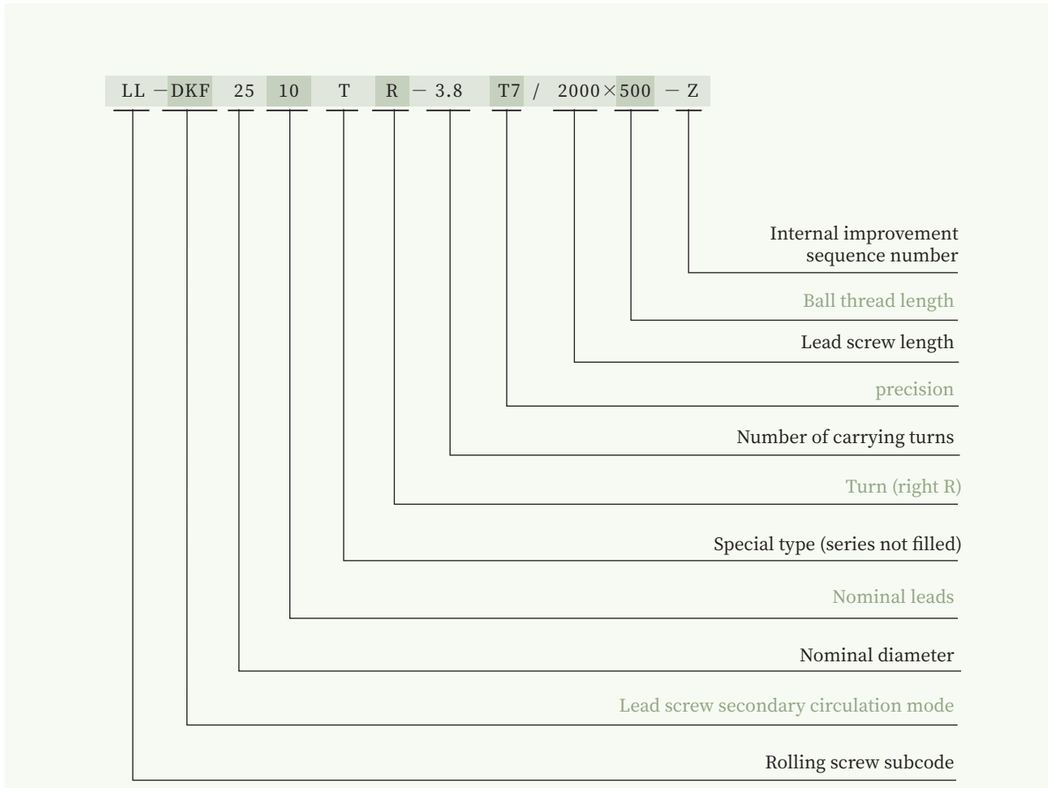
Features of rolling lead screw

The lead accuracy of the rolling lead screw can reach 7 precision class

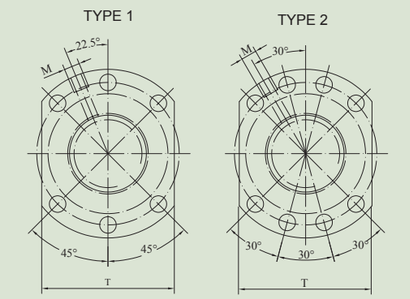
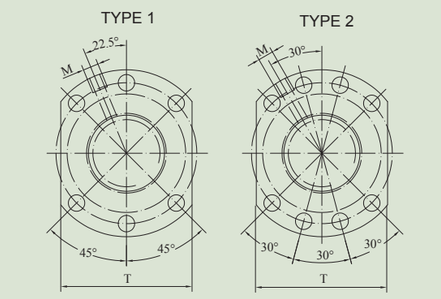
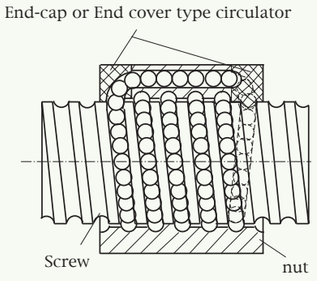
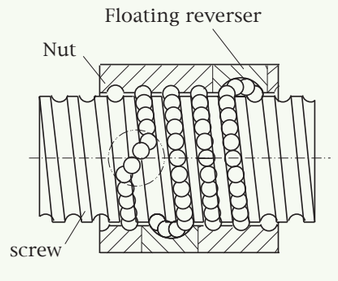
The lead of the rolled nut and the grinding nut is the same, and both are high-precision nuts with high smoothness and durability

Rolled nuts and lead screws can be shipped separately, which is more convenient in purchase

Rolling screw secondary numbering rules and meaning



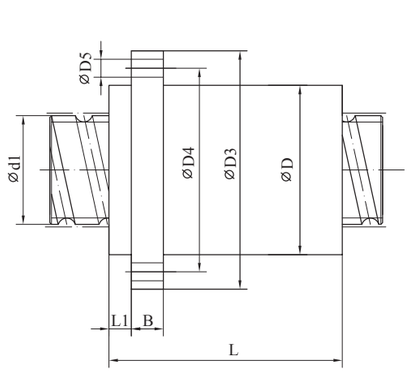
Nut form

	High speed structure	Heavy load structure
Nut form		
Flange form		
Cyclic mode	 Graphic description Number of turns n1: indicates the number of turns from one end of the inverter outlet to the other end of the inverter inlet The diagram shows 5 circles Number of spirals m: 1 Number of reversers n2:2 Total number of turns n: n=n1xm n=5x1=5	 Graphic description Number of turns n1: indicates that the number of turns from the exit of each returner to the entrance of the other end of the same returner is fixed to 1 turn Number of spirals m: 1 Number of reversers n2:4 Total number of turns n:n=n1xn2xm n=1x4x1=4
Peculiarity	1. Suitable for high-speed movement 2. The reverser is plastic	1. Suitable for heavy load 2. The reverser is metal

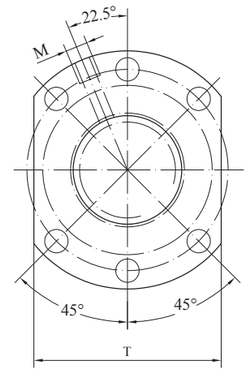
High speed series rolling ball screw

Unit: mm

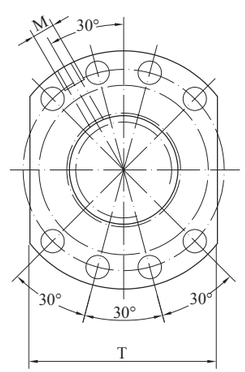
With the inner circulation mode, the steel ball size is larger, suitable for high-speed occasions
Note:
1. the nut with dust ring
2. The nut has an oil injection hole
3. the reversing device is plastic



TYPE 1



TYPE 2



Code and spec	Nominal dia d_0	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia D_w	Direction of turning	Number of turns n	Basic rated load: Dynamic load C_a kN	Basic rated load: Static load C_{oa} kN	Stiffness K_c N/μm	Nut mounting connection dimensions: Fit outer circle D	Flange outer circle D_3	L_1	B	Total nut length L	Center distance of mounting holes D_4	TYPE	Edging width T	Mounting hole diameter D_5	Oil hole M	Code and spec
LL-DKF1205-2.8	12	5	12	2.5	R	2.8	6.5	12.9	186	24	40	5	10	30	32		30	4.5	/	LL-DKF1205-2.8
LL-DKF1210-2.8	12	10	12	2.5	R	2.8	6.3	12.6	186	24	40	5	10	42	32		30	4.5	/	LL-DKF1210-2.8
LL-DKF1605-3.8	16	5	15	2.778	R	3.8	10.9	24.6	294	28	48	5	10	31	38		40	5.5	M6	LL-DKF1605-3.8
LL-DKF1610-2.8	16	10	15	2.778	R	2.8	8.2	17.8	225	28	48	5	10	42	38		40	5.5	M6	LL-DKF1610-2.8
LL-DKF1616-1.8	16	16	15	2.778	R	1.8	5.4	11.1	137	28	48	5	10	43	38		40	5.5	M6	LL-DKF1616-1.8
LL-DKF1616-2.8	16	16	15	2.778	R	2.8	7.9	17.3	216	28	48	5	10	59	38		40	5.5	M6	LL-DKF1616-2.8
LL-DKF1620-1.8	16	20	15	2.778	R	1.8	5.4	11.5	137	28	48	5	10	50	38		40	5.5	M6	LL-DKF1620-1.8
LL-DKF2005-3.8	20	5	20	3.175	R	3.8	14.5	36.1	363	36	58	7	10	33	47		44	6.6	M6	LL-DKF2005-3.8
LL-DKF2010-3.8	20	10	20	3.175	R	3.8	14.9	37.6	392	36	58	7	10	52	47		44	6.6	M6	LL-DKF2010-3.8
LL-DKF2020-1.8	20	20	20	3.175	R	1.8	7.5	17.2	186	36	58	7	10	52	47		44	6.6	M6	LL-DKF2020-1.8
LL-DKF2020-2.8	20	20	20	3.175	R	2.8	11.0	26.8	284	36	58	7	10	72	47	1	44	6.6	M6	LL-DKF2020-2.8
LL-DKF2505-3.8	25	5	25	3.175	R	3.8	16.2	45.6	421	40	62	7	10	33	51		48	6.6	M6	LL-DKF2505-3.8
LL-DKF2510-3.8	25	10	25	3.175	R	3.8	16.1	45.4	441	40	62	7	12	52	51		48	6.6	M6	LL-DKF2510-3.8
LL-DKF2525-1.8	25	25	25	3.175	R	1.8	8.3	21.6	216	40	62	7	12	60	51		48	6.6	M6	LL-DKF2525-1.8
LL-DKF2525-2.8	25	25	25	3.175	R	2.8	12.1	33.5	333	40	62	7	12	85	51		48	6.6	M6	LL-DKF2525-2.8
LL-DKF3205-3.8	32	5	32	3.175	R	3.8	18.0	59.1	500	50	80	9	12	35	65		62	9	M6	LL-DKF3205-3.8
LL-DKF3210-3.8	32	10	31	3.969	R	3.8	24.1	71.1	539	50	80	9	12	53	65		62	9	M6	LL-DKF3210-3.8
LL-DKF3220-2.8	32	20	31	3.969	R	2.8	18.7	53.7	421	50	80	9	12	72	65		62	9	M6	LL-DKF3220-2.8
LL-DKF3232-1.8	32	32	31	3.969	R	1.8	12.3	33.6	265	50	80	9	12	78	65		62	9	M6	LL-DKF3232-1.8
LL-DKF3232-2.8	32	32	31	3.969	R	2.8	18.0	52.2	412	50	80	9	12	110	65		62	9	M6	LL-DKF3232-2.8
LL-DKF4005-3.8	40	5	40	3.175	R	3.8	19.8	74.4	588	63	93	9	14	39	78		70	9	M8	LL-DKF4005-3.8
LL-DKF4010-3.8	40	10	38	6.35	R	3.8	49.3	136.6	657	63	93	9	14	57	78		70	9	M8	LL-DKF4010-3.8
LL-DKF4020-2.8	40	20	38	6.35	R	2.8	38.8	105.0	529	63	93	9	14	78	78		70	9	M8	LL-DKF4020-2.8
LL-DKF4040-1.8	40	40	38	6.35	R	1.8	25.3	65.2	333	63	93	9	14	96	78		70	9	M8	LL-DKF4040-1.8
LL-DKF4040-2.8	40	40	38	6.35	R	2.8	37.0	101.3	510	63	93	9	14	136	78		70	9	M8	LL-DKF4040-2.8
																2				
LL-DKF5005-3.8	50	5	50	3.175	R	3.8	21.6	93.5	666	75	110	10.5	15	42	93		85	11	M8	LL-DKF5005-3.8
LL-DKF5010-3.8	50	10	48	6.35	R	3.8	55.3	174.9	774	75	110	10.5	18	57	93		85	11	M8	LL-DKF5010-3.8
LL-DKF5020-3.8	50	20	48	6.35	R	3.8	56.3	181.2	853	75	110	10.5	18	98	93		85	11	M8	LL-DKF5020-3.8
LL-DKF5050-1.8	50	50	48	6.35	R	1.8	28.9	85.7	412	75	110	10.5	18	117	93		85	11	M8	LL-DKF5050-1.8
LL-DKF5050-2.8	50	50	48	6.35	R	2.8	42.2	133.4	637	75	110	10.5	18	167	93		85	11	M8	LL-DKF5050-2.8

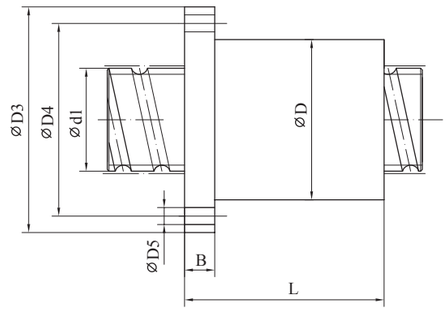
Heavy duty series rolled ball screw

Unit: mm

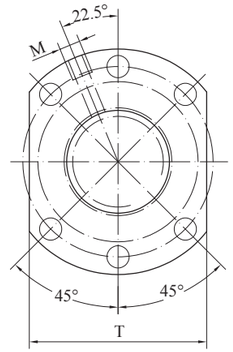
With inner circulation waist groove type, the steel ball size is larger, suitable for heavy duty occasions

Note:

1. the nut with dust ring
2. The nut has an oil injection hole
3. the reversing device is metal



TYPE 1



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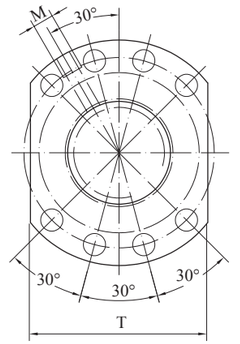
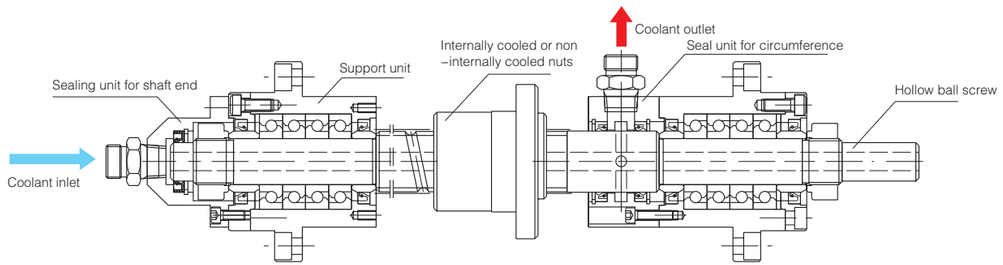


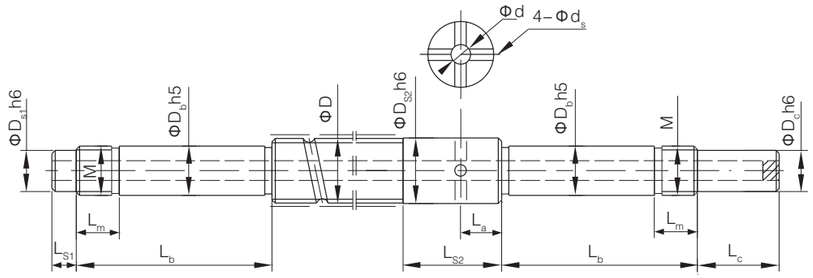
Code and spec	Nominal dia d_0	Basic lead P_{ho}	Outer dia. of ball screw d_1	Ball dia D_w	Direction of turning	Number of turns n	Basic rated load		Stiffness K_c N/μm	Nut mounting connection dimensions									Code and spec
							Dynamic load C_a kN	Static load C_{oa} kN		Fit outer circle D	Flange outer circle D_3	B	Total nut length L	Center distance of mounting holes D_4	TYPE	Edging width T	Mounting hole diameter D_5	Oil hole M	
LL-NF1605-4	16	5	16	3.175	R	4	13.5	29.9	314	28	48	10	45	38		40	5.5	M6	LL-NF1605-4
LL-NF1610-3	16	10	16	3.175	R	3	10.8	23.5	255	28	48	10	57	38		40	5.5	M6	LL-NF1610-3
LL-NF2005-4	20	5	20	3.175	R	4	15.2	38	382	36	58	10	51	47		44	6.6	M6	LL-NF2005-4
LL-NF2505-4	25	5	25	3.175	R	4	16.9	48.1	441	40	62	10	51	51	1	48	6.6	M6	LL-NF2505-4
LL-NF2510-4	25	10	25	4.762	R	4	28.9	71.5	490	40	62	12	80	51		48	6.6	M6	LL-NF2510-4
LL-NF3205-4	32	5	32	3.175	R	4	18.8	62.2	529	50	80	12	52	65		62	9	M6	LL-NF3205-4
LL-NF3210-4	32	10	32	6.35	R	4	47.1	119.6	598	50	79	12	85	65		62	9	M6	LL-NF3210-4
LL-NF4005-4	40	5	40	3.175	R	4	20.7	78.3	617	63	93	14	55	78		70	9	M8	LL-NF4005-4
LL-NF4010-4	40	10	40	6.35	R	4	52.9	151.9	715	63	93	14	88	78		70	9	M8	LL-NF4010-4
LL-NF5010-4	50	10	50	6.35	R	4	58.8	192.2	833	75	110	16	88	93	2	85	11	M8	LL-NF5010-4
LL-NF6310-4	63	10	63	6.35	R	4	65.8	248.5	970	90	125	18	93	108		95	11	M8	LL-NF6310-4
LL-NF8010-4	80	10	80	6.35	R	4	72.0	313.1	1068	105	145	20	93	125		110	13.5	M8	LL-NF8010-4
LL-NF1204-4	12	4	12	2.5	R	4	8.8	18.5	255	24	40	10	40	32		30	4.5	无	LL-NF1204-4
LL-NF1604-4	16	4	16	2.381	R	4	9.5	23.6	314	28	48	10	40	38		40	5.5	M6	LL-NF1604-4
LL-NF2004-4	20	4	20	2.381	R	4	10.4	29.3	372	36	58	10	42	47	1	44	6.6	M6	LL-NF2004-4
LL-NF2504-4	25	4	25	2.381	R	4	11.6	37.2	421	40	62	10	42	51		48	6.6	M6	LL-NF2504-4
LL-NF3204-4	32	4	32	2.381	R	4	12.7	47.4	500	50	80	12	44	65		62	9	M6	LL-NF3204-4
LL-NF6320-4	63	20	63	9.525	R	4	112.2	359.2	1098	95	135	20	149	115	2	100	13.5	M8	LL-NF6320-4
LL-NF8020-4	80	20	80	9.525	R	4	126.5	467.9	1352	125	165	25	154	145		130	13.5	M8	LL-NF8020-4

Hollow strong cooling ball screw

Recommended structure and size of hollow ball screw

With the high-speed transmission mechanism, especially in the high-precision positioning of the ball screw will occur thermal expansion, our company adopts the hollow ball screw forced cooling method to solve the problem. The ball screw shaft end (sealing part and supporting bearing part) is standardized and recommended to users as the most effective and low way to reduce thermal expansion. In addition, there is a nut cooling ball screw, the product is designed with a cooling structure inside the nut, is a simple way to effectively cool, used for high-speed, high-precision ball screw. Due to the use of nut cooling, cooling is possible for some ball screws that are difficult to cool in a hollow way, and the corresponding range covers the high-precision needs of machine tools from small to large.

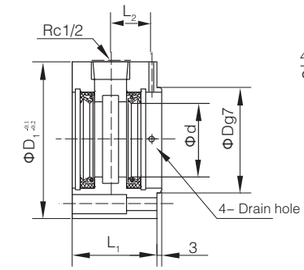


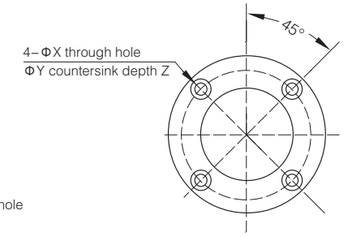


Unit: mm

Specification	Shaft		Bearing support position					Sealing part								Driving part	
	Outside Diameter D	Inside Diameter d	Outer diameter D_b	Locking nut part			Support unit	Coolant inlet		Coolant outlet				Sealing unit			
				M	L_m	L_b		D_{s1}	L_{s1}	D_{s2}	L_{s2}	L_a	d_s	Sealing unit for shaft end	Circular sealing unit	D_c	L_c
32	32	10	25	M25×1.5	26	119	ZCDY25QFC	20	15	32	60	25	6	ZDMF20	YZMF32	20	40
40	40	12	30	M30×1.5	26	119	ZCDY30QFC	25	15	40	60	25	7	ZDMF25	YZMF40	25	50
50	50	15	40	M40×1.5	30	122	ZCDY40QFC	32	15	50	65	27	8	ZDMF32	YZMF50	35	70
63	63	18	50	M50×1.5	36	154	ZCDY50QFC	40	20	60	90	32	10	ZDMF40	YZMF60	45	100

Circular sealing unit (customized product for hollow cooling ball screw)

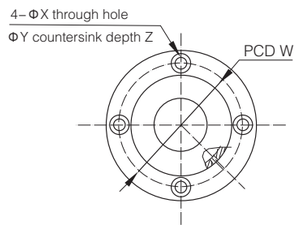


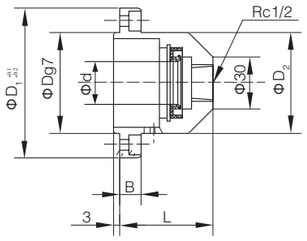


Unit: mm

Nominal model of seal unit for circumference	d	D	D_1	L_1	L_2	W	X	Y	Z
YZMF32	32	57	85	46	25	70	6.6	11	30
YZMF40	40	57	85	46	25	70	6.6	11	30
YZMF50	50	69	95	49	27	80	6.6	11	30
YZMF60	60	97	132	60	32	114	9	14	40

Sealing unit for shaft end (customized product for hollow cooling ball screw)





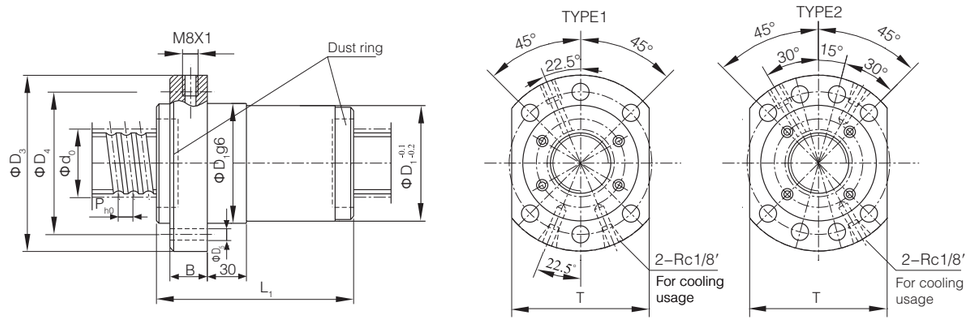
Installation precautions:

1. When installing on the ball screw shaft, grease the sealing lip, taking care not to damage the sealing lip.
2. After the sealing unit is installed, ensure that the drainage holes face down.

Unit: mm

Nominal model of sealing unit for shaft end	d	D	D_1	D_2	L	W	X	Y	Z	B
ZDMF20	20	57	85	57	56	70	6.6	11	6.5	12
ZDMF25	25	57	85	57	56	70	6.6	11	6.5	12
ZDMF32	32	69	95	67	61	80	6.6	11	6.5	12
ZDMF40	40	97	132	97	71	114	9	14	9	15

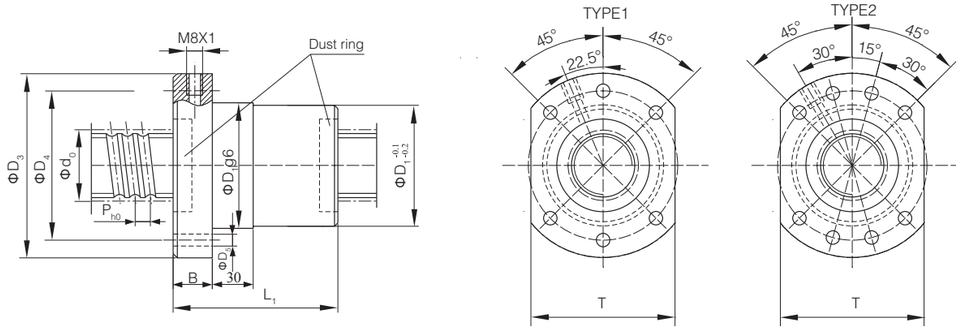
Internal cooling nut mounting dimension parameter table



Unit: mm

Type	Nominal diameter d_0	Basic lead P_{h0}	Basic rated load (KN)		Nut joint size							
			Dynamic load	Static load	TYPE	D_1	D_3	D_4	D_5	B	T	L_1
DKFB4016TR-4	40	16	57.1	130	1	86	128	106	11	16	96	160
DKFB4020TR-4	40	20	44.5	123.3	1	86	128	106	11	16	96	190
DKFB5020TR-5	50	20	52.1	165.7	2	95	135	115	11	16	100	149
DKFB5025TR-5	50	25	52	165.7	2	95	135	115	11	16	100	172
DKFB5030TR-5	50	30	51.8	165.7	2	95	135	115	11	16	100	198
DKFB6312TR-5	63	12	97.5	257.3	1	115	161	137	13.5	22	125	180
DKFB6325TR-5	63	25	57.3	206.3	2	110	158	132	13.5	22	125	172
DKFB6330TR-5	63	30	57.1	206.2	2	110	158	132	13.5	22	125	197
DKFB6340TR-5	63	40	56.8	206.4	2	110	158	132	13.5	22	125	251

Non-internally cooled nut mounting dimension parameter table

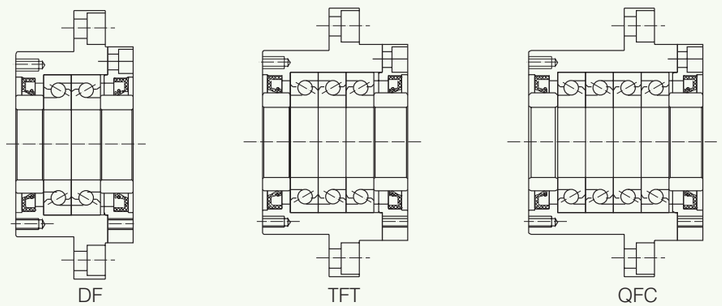


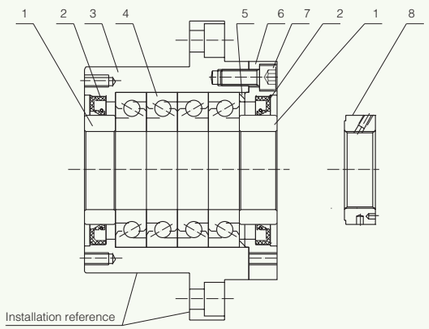
Unit: mm

Type	Nominal diameter d_0	Basic lead P_{h0}	Basic rated load (KN)		Nut joint size							
			Dynamic load	Static load	TYPE	D_1	D_3	D_4	D_5	B	T	L_1
DKFB4016TR-4	40	16	57.1	130	1	86	128	106	11	16	96	160
DKFB4020TR-4	40	20	44.5	123.3	1	86	128	106	11	16	96	190
DKFB5020TR-5	50	20	52.1	165.7	2	82	118	100	11	16	92	139
DKFB5025TR-5	50	25	52	165.7	2	82	118	100	11	16	92	164
DKFB5030TR-5	50	30	51.8	165.7	2	82	118	100	11	16	92	189
DKFB6312TR-5	63	12	97.5	257.3	1	100	138	120	13.5	22	105	175
DKFB6325TR-5	63	25	57.3	206.3	2	95	135	115	13.5	22	100	163
DKFB6330TR-5	63	30	57.1	206.2	2	95	135	115	13.5	22	100	188
DKFB6340TR-5	63	40	56.8	206.4	2	95	135	115	13.5	22	100	238

Support unit

The bearing used in the support unit is a high-precision and high-stiffness thrust angular contact bearing dedicated to the ball screw, and the combination has the following three kinds.





8 Locknut
7 Hex socket cylindrical head screws
6 Supporting unit gland
5 Supporting unit gasket
4 Special bearing used for ball screw
3 Support unit shell
2 Oil seal
1 Support unit shaft ring

Note:

1.The outer circle and end face of the support unit in the figure are the installation reference

2. 2.3.4.5.6.7 in the figure is an integrated component. Do not split it at will to avoid affecting accuracy.

Rotary nut assembly unit

The rotating nut assembly unit is a transmission system that converts the rotating motion of the ball nut into the linear motion of the nut itself (or the ball screw). It is an extension of ball screw pair, and its main components are composed of ball screw pair, rolling bearing pair, nut holder, pre-tightening adjustment (locking) device, dust-proof device, lubricating oil path, etc. The installation structure diagram is shown in Figure 1 below.

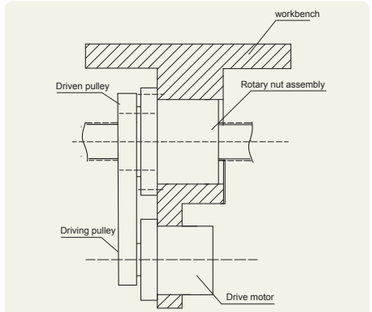


Fig-1

1. The characteristics of rotating nut combination unit

- Low inertia. Compared with the screw rotation as the active drive, the nut rotation as the active drive greatly reduces the moment of inertia of the mechanical movement system, improves the limit speed of the system, and is easy to achieve high-speed transmission, while making the selected motor power smaller.
- High stiffness. The bearing size arranged on the outer circle of the nut is larger than that of the lead screw rotation as the active drive;At the same time, because the lead screw does not rotate, there is no need to install bearings on the shaft journal, and greater axial pretensile force can be applied to the lead screw, so that the stiffness of the whole set of ball screw pair can be greatly improved.
- Multi-nut drive. Multiple rotating nut combination units can be installed on a ball screw, and multiple tables are driven simultaneously or separately, and their movements do not interfere with each other.
- Easy to design and install. The rotary nut assembly unit integrates multiple functional parts in one, simplifying design and facilitating installation and commissioning.
- Other. Because the lead screw does not rotate, there is no circumferential friction at the central auxiliary support, and there is no local heating problem.When the positioning accuracy is high and the influence of temperature rise is considered and the lead screw hollow cooling structure is used, the cooling pipe joint is easier to arrange and install because the lead screw does not rotate.

Special note

- It is recommended that when the length-diameter ratio of the lead screw is ≥80, or even ≥60, several radial auxiliary supports should be set in the middle of the lead screw.
- In addition to the necessary installation interface size of the rotating nut combination unit, the sample also gives the "recommended type size of lead screw journal" and "recommended type size of synchronous belt wheel (gear)" for the reference of the main engine designer.
- Sample given is the company's standard series of products, if the standard series of products can not meet the demand, you can contact our company special order.

2. the precision of the rotating nut combination unit

Refer to the ball screw standard GB/T17587.3.

3. the pre-tightening of the rotating nut combination unit

In this sample, light load and heavy load are introduced.The light load type rotary nut assembly unit is generally not pre-tightened and is used as a drive. The heavy-duty rotary nut combination unit adopts gasket pre-tightening, which is generally pre-tightened according to the 5% rated dynamic load of the model before leaving the factory.

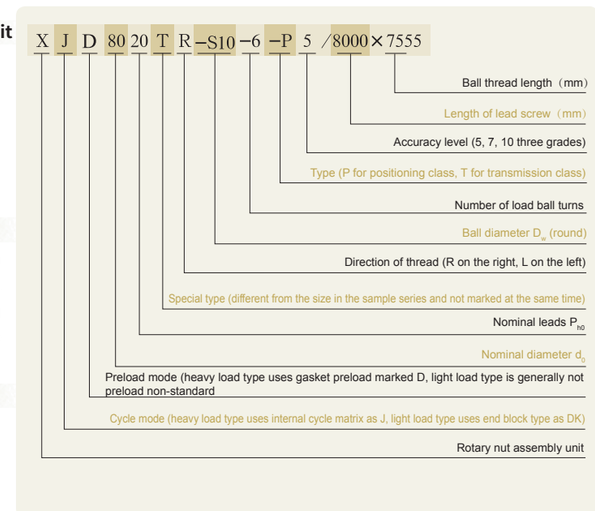
4. Lubrication of rotating nut combination unit

The nut seat is equipped with a standard metric lubrication interface, which can be lubricated by centralized lubrication at the gas station or manual oil injection according to the working condition.Two oil circuits, one for rolling bearing lubrication, the other for ball nut lubrication.

5. Dust proof of rotating nut combination unit

The ball screw pair and the rolling bearing pair in the combined unit have been equipped with a conventional dustproof device.It is recommended to install other dust proof (cover, sleeve) devices on the work table, which is more conducive to reducing wear and extending life.

6. Numbering rules and meaning



7. synchronous belt wheel (gear) recommended type size

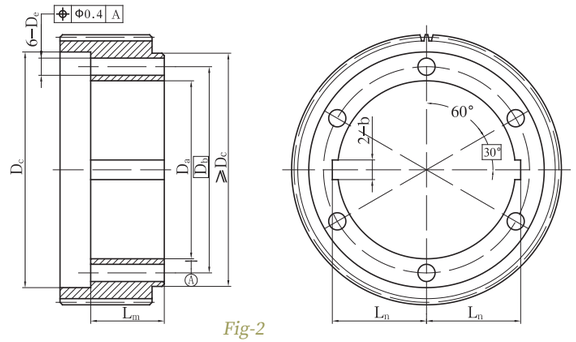


Fig-2

TAB -1

Unit: mm

NO.	D_a(H8)	D_b	L_m	D_c	D_e	b(H9)	$L_n(^{+0.2}_{0})$
1	75	90	15	105	9	12	41.8
2	95	110	15	125	9	12	51.8
3	100	118	15	133	9	12	53.8
4	120	138	35	156	11	12	63.8
5	145	165	45	185	14	12	76.3

8. Recommended type and size of lead screw journal

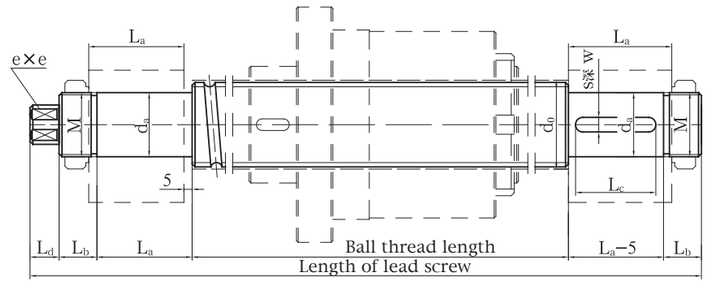


Fig-3

Note:

The installation direction of the nut seat flange shown in the figure is the default direction

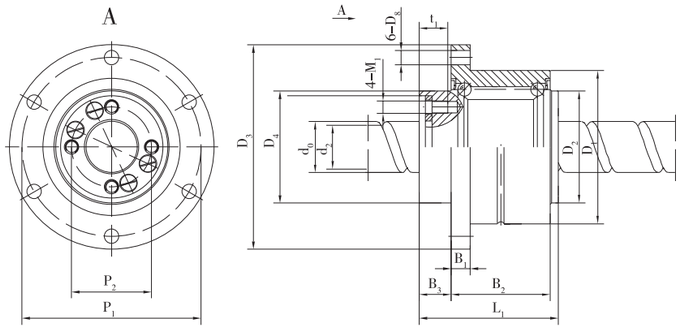
TAB -2

Unit: mm

Nominal diameter d_0	d_a(h7)	L_a	M	L_b	r(N9)	w	L_c	e	L_d
50	40	100	M40×1.5	40	12	4.5	80	27	30
63	50	125	M50×1.5	40	12	4.5	80	32	30
80	65	160	M65×2	50	12	4.5	80	36	30
100	80	200	M80×2	50	20	7	125	50	30

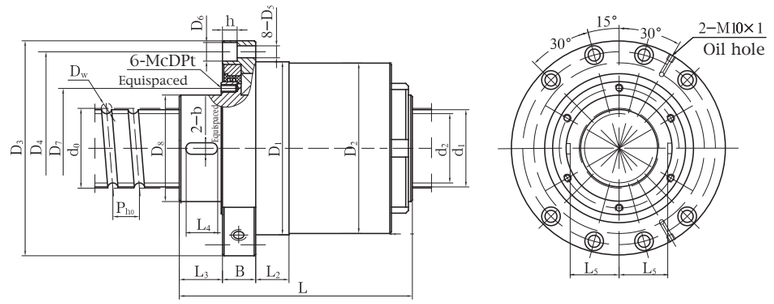
XDK Light load rotary nut assembly unit

Unit: mm



Specification code	Nominal diameter d_0	Nominal leads P_{ho}	Lead screw outside diameter d_1	Number of load ball turns	Ball diameter D_w	Screw base diameter d_2	D_1(g6)	L_1	D_2	D_3	Nut mounting dimension									Basic load rating of lead screw		Basic load rating of supporting bearing		Specification code
											D_4 (h7)	P_1	P_2	B_1	B_2	B_3	M_1	D_8	t_1	dynamic load C_a (kN)	Static load C_{oa} (kN)	dynamic load C_a (kN)	Static load C_{oa} (kN)	
XDK1616R-S3-2	16	16	16	2	2.778	8.8	48	45	35	64	36	56	25	6	21	10	4	4.5	14	5.2	8.3	6.5	9.3	XDK1616R-S3-2
XDK2020R-S3-2	20	20	20	2	3.175	17.7	56	52	39	72	43.5	64	31	6	21	11	5	4.5	18	7.0	12.0	7.1	12	XDK2020R-S3-2
XDK2525R-S4-2	25	25	25	2	3.969	22.1	66	66	50	86	52	75	38	7	25	13	6	5.5	18	10.4	18.8	10.3	18.5	XDK2525R-S4-2
XDK3232R-S5-2	32	32	32	2	4.763	28.1	78	78	58	103	63	89	48	8	25	14	6	6.6	17	14.8	28.4	11.3	22.9	XDK3232R-S5-2

XJD heavy duty rotary nut assembly unit



Unit: mm

Specification code	Nominal diameter d_0	Nominal leads P_{h0}	Lead screw outside diameter d_1	Ball diameter D_w	Screw base diameter d_2	Number of load ball turns n	Dynamic load rating C_a kN	Limiting axial load① C_{oa}MAXkN	L	Nut mounting dimension D_1(g6)	$D_2(^{-0.1}_{-0.2})$	L_2	D_3	B	D_4	D_5	D_6	h	Synchronous pulley (gear) mounting dimensions D_7	D_8(g6)	L_3	b(N9)	L_4	$L_5(^{0}_{0.2})$	Mc	t	Specification code
XJD6316R-S10-7	63	16	63	9.525	55.5	7	175	570	360	195	195	40	243	40	219	13.5	20	13	118	100	50	12	40	45.5	8	15	XJD6316R-S10-7
XJD6320R-S10-6	63	20	63	9.525	55.5	6	153	488	360	195	195	40	243	40	219	13.5	20	13	118	100	50	12	40	45.5	8	15	XJD6320R-S10-6
XJD8016R-S10-8	80	16	80	9.525	72.5	8	223	850	360	220	220	50	280	50	250	17.5	26	17.5	138	120	50	12	40	55.5	10	20	XJD8016R-S10-8
XJD8020R-S13-6	80	20	80	12.7	70.9	6	314.9	789	360	220	220	50	280	50	250	17.5	26	17.5	138	120	50	12	40	55.5	10	20	XJD8020R-S13-6
XJD8025R-S13-5	80	25	80	12.7	70.9	5	268.6	656	360	220	220	50	280	50	250	17.5	26	17.5	138	120	50	12	40	55.5	10	20	XJD8025R-S13-5
XJD8032R-S13-4	80	32	80	12.7	70.9	4	220.8	523	360	220	220	50	280	50	250	17.5	26	17.5	138	120	50	12	40	55.5	10	20	XJD8032R-S13-4
XJD8040R-S13-3	80	40	80	12.7	70.9	3	171.4	391	360	220	220	50	280	50	250	17.5	26	17.5	138	120	50	12	40	55.5	10	20	XJD8040R-S13-3
XJD10016R-S10-8	100	16	97	10	89.7	8	249	1087	375	245	245	50	319	50	282	22	33	21.5	165	145	50	12	40	68	12	25	XJD10016R-S10-8
XJD10020R-S13-7	100	20	97	12.7	87.8	7	396.6	1144	375	245	245	50	319	50	282	22	33	21.5	165	145	50	12	40	68	12	25	XJD10020R-S13-7
XJD10025R-S16-5	100	25	97	15.875	85.5	5	402.7	966	375	245	245	50	319	50	282	22	33	21.5	165	145	50	12	40	68	12	25	XJD10025R-S16-5
XJD10032R-S16-4	100	32	97	15.875	85.5	4	331.5	771	375	245	245	50	319	50	282	22	33	21.5	165	145	50	12	40	68	12	25	XJD10032R-S16-4
XJD10040R-S16-3	100	40	97	15.875	85.5	3	257.9	577	375	245	245	50	319	50	282	22	33	21.5	165	145	50	12	40	68	12	25	XJD10040R-S16-3

Note 1: If the standard size can not meet the customer's design requirements, please contact our company for special orders.
Note 2: Contact us when the axial force exceeds the rated dynamic load.

DKG(J) ball screw rolling spline compound unit

1. ball screw rolling spline compound unit

Ball screw rolling spline composite unit is a new type of composite rolling functional unit developed for the application field of automatic and intelligent production line.The products are widely used in horizontal multi-joint robot (SCARA) Z axis, dispensing machine, welding machine, automatic loader, automatic testing equipment and machining center ATC (automatic tool change) and other rotary motion and linear motion mechanical combination device.Ball screw rolling spline composite unit is a new type of composite rolling functional unit developed for the application field of automatic and intelligent production line.The products are mainly composed of hollow screw spline shaft, ball nut rolling bearing composite unit, spline sleeve rolling bearing composite unit and other parts.

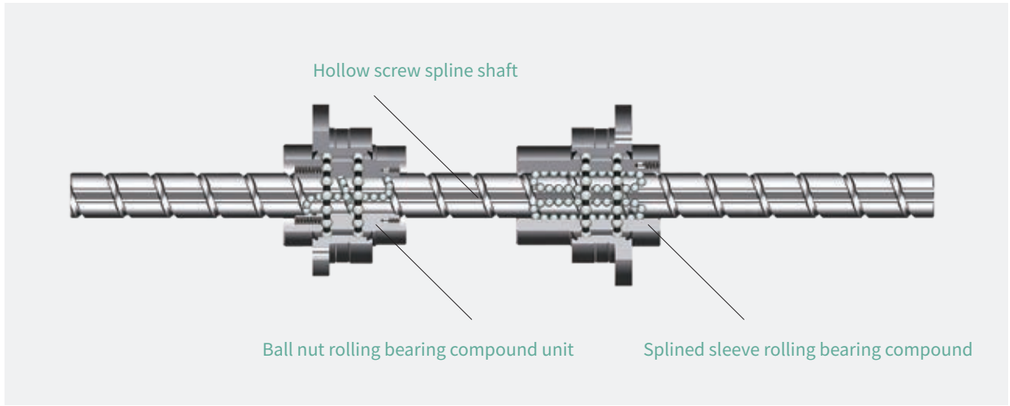


Fig-1

2. Features

- Spline shaft for shaft end structure requirements

The ball screw spiral raceway and rolling spline (straight) raceway are cross-designed on the same shaft, and the ball nut and spline sleeve are respectively integrated with the rolling bearing height. Through the rotation or stop of the ball nut and spline sleeve, the screw spline shaft can be rotated, straight and spiral in 3 forms of compound movement.

- Lightweight, low inertia

Lead screw spline shaft adopts hollow design, the overall weight is light; The ball nut and spline sleeve are integrated with the bearing design, making the radial size of the ball nut rolling bearing compound unit and the spline sleeve rolling bearing compound unit small enough and the moment of inertia extremely low.

- High speed, low noise

Ball screw selection of large lead design, coupled with the rotating unit moment of inertia is very low, low noise at high speed movement.

- Easy to install

The two ends of the ball nut rolling bearing composite unit and spline sleeve rolling bearing composite unit are provided with standard driving pulley connecting parts, which is convenient for user selection and easy installation.

3. the principle of movement

- Basic principle of DKGJ

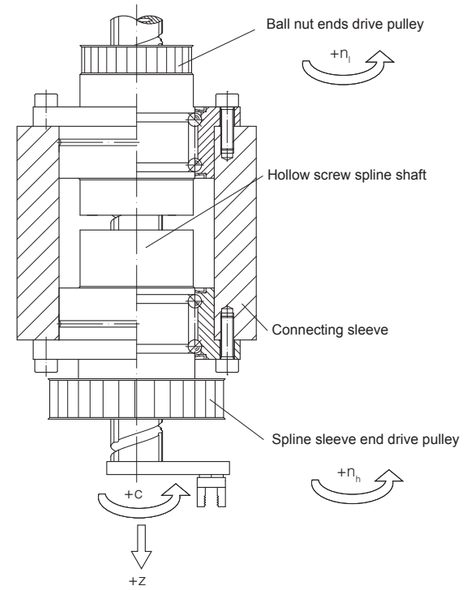


Fig-2

TAB -1

Output motion diagram	Input (drive pulley)		Output (screw spline shaft movement)	
	Rolling nut end drive pulley n_l	Spline sleeve end drive belt n_h	Straight line motion up and down (Z) direction	Rotational motion in positive and negative (C) directions
Motion form one: linear motion	Forward set	non-rotation	Downward motion Velocity value=$n_l \times P_h$	non-rotation
	reversal	non-rotation	Upward motion Velocity value=$-n_l \times P_h$	non-rotation
Motion form two: rotational motion	Forward set	Forward set 且$n_h = n_l$	No exercise	Forward set Revolution value=n_h
	reversal	reversal 且$n_h = n_l$	No exercise	reversal Revolution value=$-n_h$
Movement form three: spiral movement	non-rotation	Forward set	Upward motion Velocity value=$n_h \times P_h$	Forward set Revolution value=n_h
	non-rotation	reversal	Downward motion Velocity value=$-n_h \times P_h$	reversal Revolution value=$-n_h$

Note: The Ph in the table is the lead of the ball screw, and the screw rotation is left

4. The principle of movement

● Basic principle of DKG type

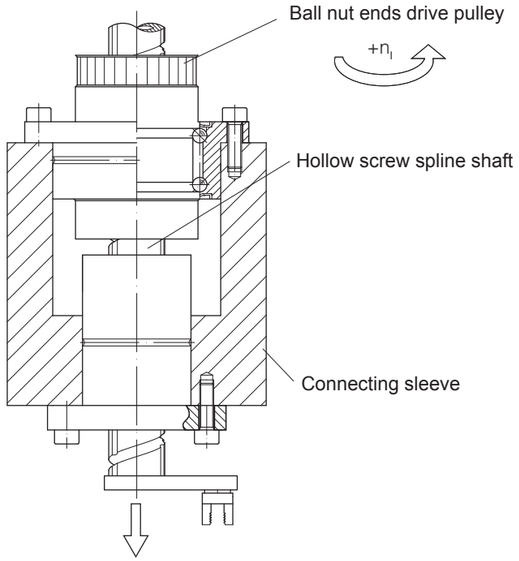
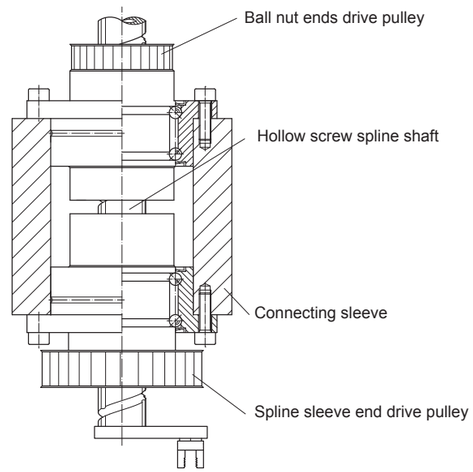


Fig-3

TAB -2

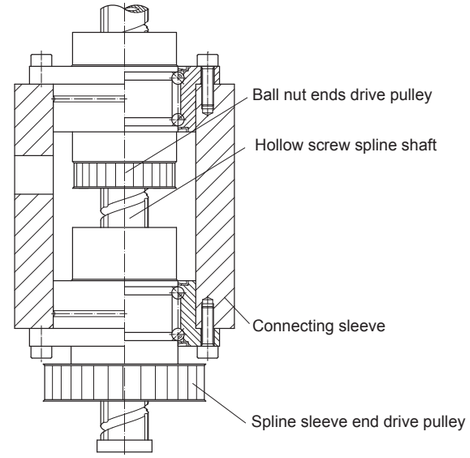
Output motion diagram	Input (drive pulley)	Output (screw spline shaft movement)
	Rolling nut end drive pulley n_l	Straight line motion up and down (Z) direction
Motion form: straight line motion (−Z, +Z)	Forward set	Downward motion Velocity value=$n_l \times P_h$
	reversal	Upward motion Velocity value=$-n_l \times P_h$

5. Recommended installation method



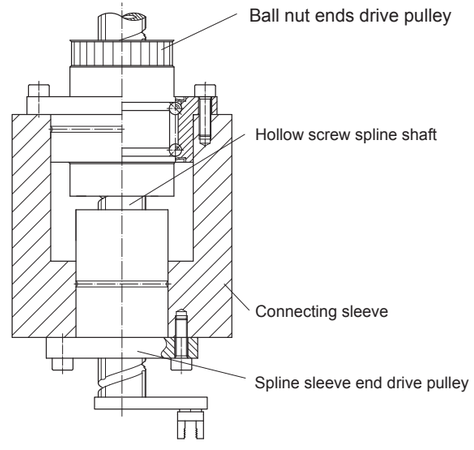
Example of external installation of DKGJ ball nut end drive pulley

Fig-4



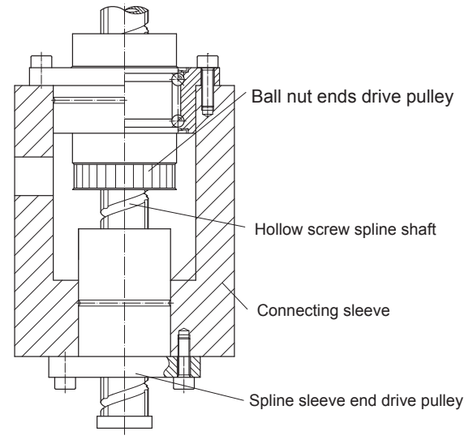
Example of internal installation of DKGJ ball nut end drive pulley

Fig-5



Example of external installation of DKG ball nut end drive pulley

Fig-6

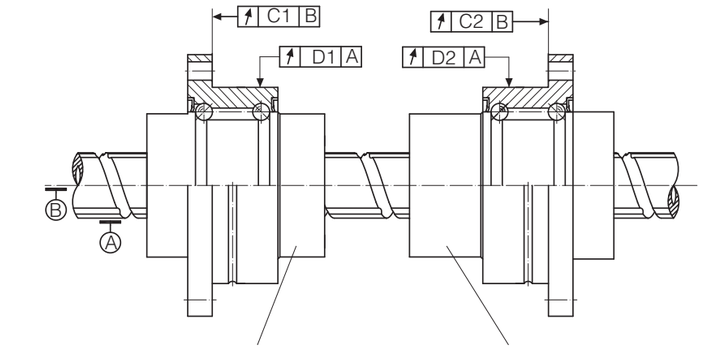


Example of internal installation of DKG ball nut end drive pulley

Fig-7

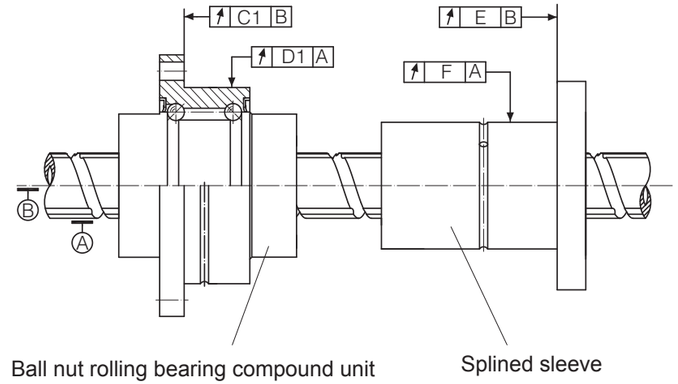
6. Accuracy grade

- Ball screw: The pretightening method is to increase the ball diameter and pretighten, the accuracy level is P5 (corresponding to Japanese JIS B 1192 standard C5), if you have higher accuracy requirements, please contact us.
- Rolling spline: The torsion gap is light prepressing, the accuracy level is the national standard GB/T 40310.1 standard C3 (corresponding to Japanese JIS B 1193 standard C3), if you have higher accuracy requirements, please contact us.
- Shape position tolerance:



(DKGJ)

Fig-8



(DKG)

Fig-9

TAB -3

Unit: mm

Specification	C1	D1	C2	D2	E	F
DKGJ1616	0.03	0.025	0.026	0.022	0.02	0.018
DKG1616						
DKGJ2020	0.03	0.025	0.026	0.022	0.02	0.018
DKG2020						
DKGJ2525	0.03	0.025	0.026	0.022	0.02	0.018
DKG2525						
DKGJ3232	0.035	0.03	0.03	0.025	0.025	0.02
DKG3232						

7. Numbering rules and meaning

DKG(J) 16 16 H T / 400 × 350 × 350 – □

- Improved serial number, no time is not marked
- Effective length of ball screw raceway
- Effective length of ball spline raceway
- Hollow screw spline shaft length
- Special type code (standard type is not standard)
- Rolling bearing structure serial number (where H means heavy, light non-standard)
- Nominal lead of ball screw (divided into: 16,20,25,32)
- Hollow screw spline shaft nominal diameter (divided into: 16,20,25,32)
- Ball screw rolling spline compound unit code: DKGJ and DKG

8. Lubrication

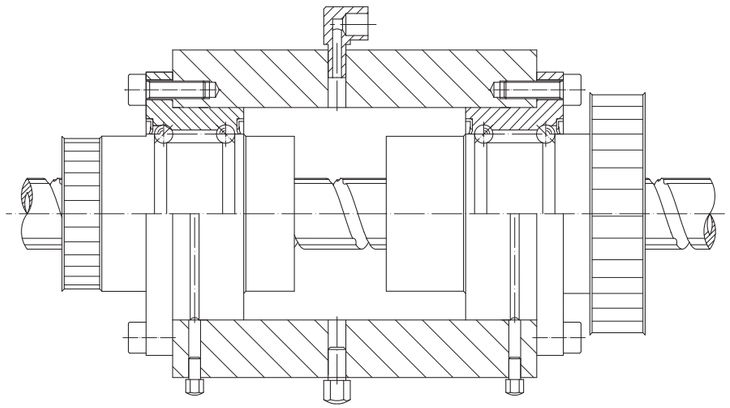
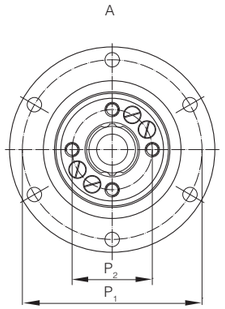


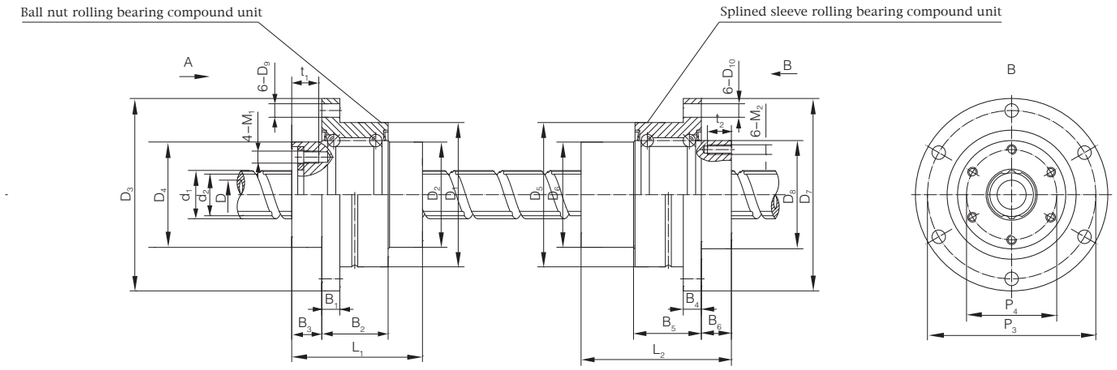
Fig-10

9. Precautions

- Please use the product under the specified load. If the load exceeds the value indicated in the sample, please contact us.
- The length of the spline shaft of the hollow screw shall not exceed 25 times of its corresponding nominal diameter.
- When installing, take out the spline sleeve rolling bearing composite unit along one end of the raceway (with the help of the assembly auxiliary sleeve), install it after installation, do not take out the ball nut rolling bearing composite unit.
- For other safe use, please refer to P93 and P167.
- If you have any special requirements, please contact us.

DKGJ type mounting connection dimensions





Ball screw part

Unit: mm

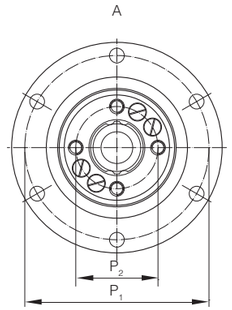
Specification code	Hollow screw spline shaft part dimensions																						Specification code
	Nominal diameter d_0	Nominal leads P_{ho}	Lead screw outside diameter d_1	Total number of cycles	Screw base diameter d_2	D	D_1 g6	L_1	D_2	D_3	D_4 h7	P_1	P_2	B_1	B_2		B_3	M_1	D_9	t_1	Basic load rating of lead screw		Basic load rating of support shaft		
																					Dynamic load (kN)	Static load (kN)	Dynamic load (kN)	Static load (kN)	
DKGJ1616	16	16	16	1.8	13.7	11	48	45	35	64	36	56	25	6	21		10	4	4.5	14	5.2	8.3	6.5	9.3	DKGJ1616
DKGJ2020	20	20	20	1.8	17.4	14	56	52	39	72	43.5	64	31	6	21		11	5	4.5	18	7.0	12.0	7.1	12	DKGJ2020
DKGJ2525	25	25	25	1.8	22	18	66	66	50	86	52	75	38	7	25		13	6	5.5	18	10.4	18.8	10.3	18.5	DKGJ2525
DKGJ3232	32	32	32	1.8	28.1	23	78	78	58	103	63	89	48	8	25		14	6	6.6	16	14.8	28.4	11.3	22.9	DKGJ3232

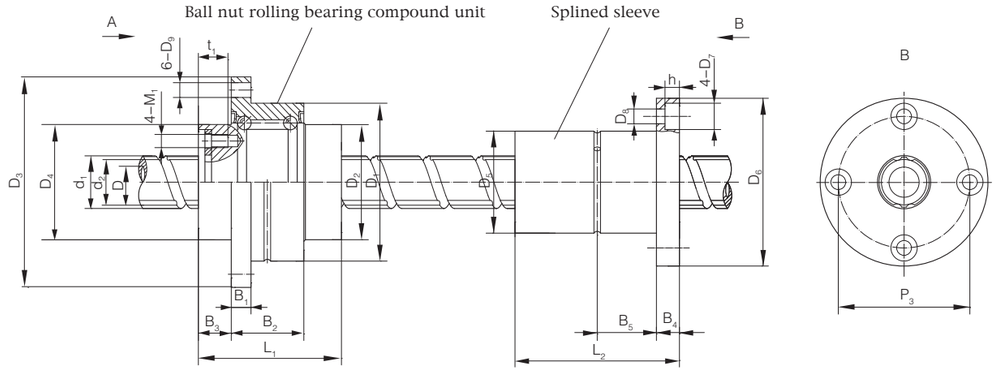
Scroll the spline section

Unit: mm

Specification code	Spline sleeve rotation unit part dimensions																				Specification code
	Basic rated torque		D_5 g6	L_2	D_6	D_7	D_8 h7	P_3	P_4	B_4		B_5	B_6	M_2	D_{10}	t_2	Basic spline load rating		Basic load rating of support shaft		
	Dynamic torque (N·m)	Static torque (N·m)															Dynamic load (kN)	Static load (kN)	Dynamic load (kN)	Static load (kN)	
DKGJ1616	41.6	57.2	48	50	31	64	36	56	30	6		21	10	4	4.5	13	5.2	7.2	6.7	6.4	DKGJ1616
DKGJ2020	68.9	93	56	63	35	72	43.5	64	36	6		21	12	5	4.5	14	7.0	9.4	7.4	7.8	DKGJ2020
DKGJ2525	190	326.8	66	71	42	86	52	75	44	7		25	13	5	5.5	16.3	9.5	13.3	9.7	10.6	DKGJ2525
DKGJ3232	331.3	572	78	80	52	103	63	89	54	8		25	17	6	6.6	18	13.1	18.3	15.2	15.7	DKGJ3232

DKG type mounting connection dimensions





Ball screw part

Unit: mm

Specification code	Hollow screw spline shaft part dimensions																							Specification code
	Nominal diameter d_0	Nominal leads P_{ho}	Lead screw outside diameter d_1	Total number of cycles	Screw base diameter d_2	D	D_1 g6	L_1	D_2	D_3	D_4 h7	P_1	P_2	B_1	B_2		B_3	M_1	D_9	t_1	Basic load rating of lead screw		Basic load rating of support shaft		
																					Dynamic load (kN)	Static load (kN)	Dynamic load (kN)	Static load (kN)	
DKG1616	16	16	16	1.8	13.7	11	48	45	35	64	36	56	25	6	21		10	4	4.5	14	5.2	8.3	6.5	9.3	DKG1616
DKG2020	20	20	20	1.8	17.4	14	56	52	39	72	43.5	64	31	6	21		11	5	4.5	18	7.0	12.0	7.1	12	DKG2020
DKG2525	25	25	25	1.8	22	18	66	66	58	86	52	75	38	7	25		13	6	5.5	18	10.4	18.8	10.3	18.5	DKG2525
DKG3232	32	32	32	1.8	28.1	23	78	78	60	103	63	89	48	8	25		14	6	6.6	16	14.8	28.4	11.3	22.9	DKG3232

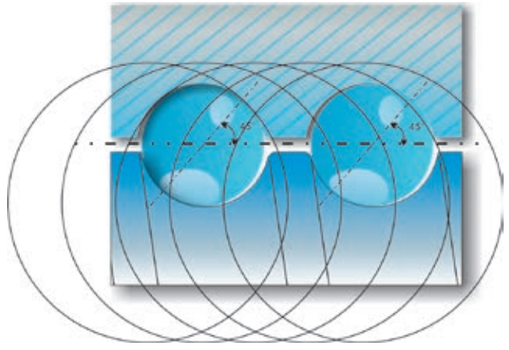
Scroll the spline section

Unit: mm

Specification code	Scroll the spline section													Specification code
	Basic rated torque		D_5 h6	L_2	D_6	D_7	D_8		h	B_4	B_5	P_3	Basic spline load rating	
	Dynamic torque (N·m)	Static torque (N·m)											Dynamic torque (kN)	Static torque (kN)	
DKG1616	41.6	57.2	31	50	51	8	4.5		6	10	18	40	5.2	7.2	DKG1616
DKG2020	68.9	93	35	56	58	9.5	5.5		5.4	10	18	45	7.0	9.4	DKG2020
DKG2525	190	326.9	42	71	65	9.5	5.5		8	13	26.5	52	9.5	13.3	DKG2525
DKG3232	331.3	572	49	80	77	11	6.6		6.5	13	30	62	13.1	18.3	DKG3232

Planetary roller screw

1. Comparison of roller screw pair and ball screw



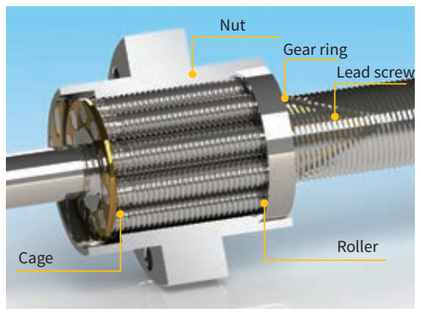
Comparison diagram of the number, curvature radius and envelope circle of contact surface of roller lead screw rolling body

Fig-1

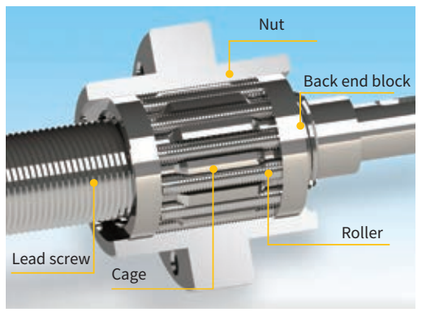
2. the classification and application of planetary roller screw

Roller screw pairs can be divided into standard planetary roller screw pairs, circulating planetary roller screw pairs, reverse planetary roller screw pairs and other types according to the structure and movement characteristics.There are essential differences in the operation mode of the roller: the roller of the standard planetary roller screw pair has no axial displacement relative to the nut when it is rotating and rotating.

In addition to rotating and rotating, the roller of the circulating planetary roller screw has a cyclic movement of the axis upward relative to the nut. The roller of the reverse planetary roller lead screw pair has no axial displacement relative to the lead screw during revolution and rotation.

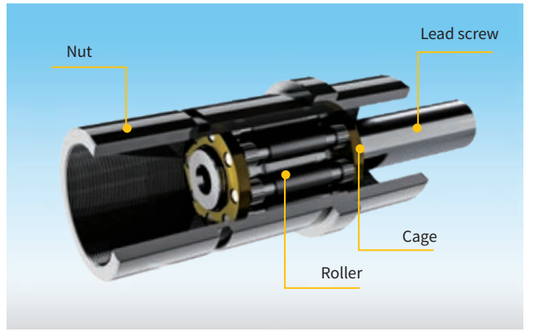


Standard planetary roller screw



Cyclic planetary roller screw

Fig-2



Reverse planetary ball screw

Fig-2

The difference in structure determines its different application scope:

The standard planetary roller screw pair has a high load bearing capacity and high reliability, mainly used in:

- Injection molding
- Pressure machine
- Steel industry
- Military equipment
- Nuclear Industry

Due to the small spiral lead (1~2mm), the circulating planetary roller screw pair has a high lead resolution, coupled with its high carrying capacity and high reliability, mainly used in:

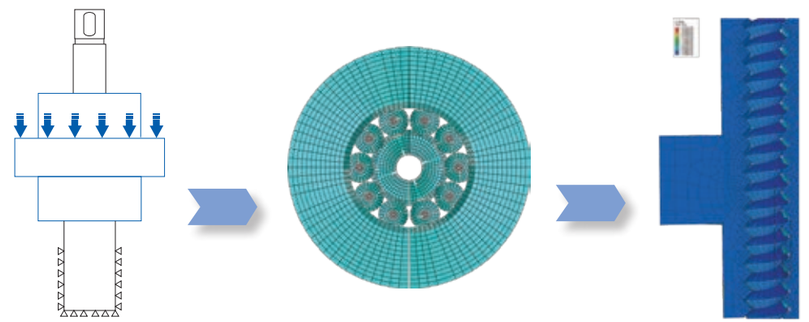
- Precision instrument
- Precision grinding machine
- Medical equipment
- Aerospace

The nut of the reverse planetary roller lead screw pair rotates as an active part to output motion, which helps to realize the integrated compact design of the motor and the roller lead screw, suitable for electric linear actuator, mainly used in:

- Aerospace
- Robotics industry
- Electric cylinder
- Defense industry

3. Contact analysis of planetary roller screw pair under given load

Taking 3020 planetary roller screw as an example, the contact stress under the given axial load is analyzed.The mesh elements of each contact element are hexahedral elements, so as to improve the calculation accuracy of CAE contact analysis.The analysis process is shown in the figure below:

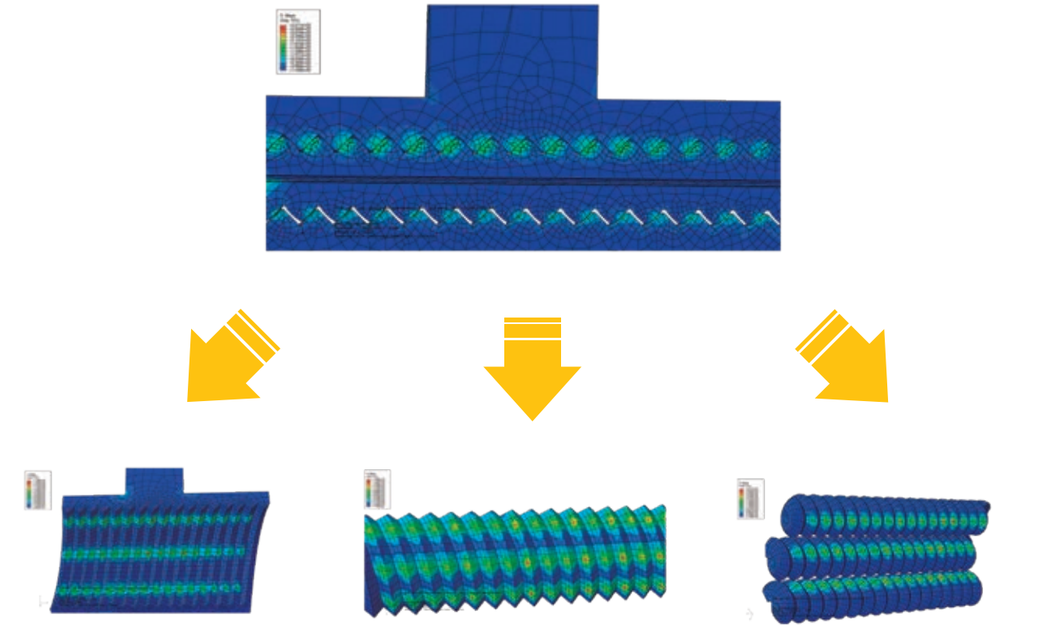


An axial load of 172KN is applied to the nut flange face

CAE meshing

CAE post processing

Fig-3



Contact stress on nut raceway surface

Contact stress on the surface of the lead screw raceway

Contact stress on the surface of the roller raceway

Fig-4

Through the above analysis, it can be determined that the maximum contact stress of each contact element surface is located on the roller spiral raceway surface.After checking the relevant literature, when the surface hardness of GCr15 material for ordinary lead screw reaches HRC63 after heat treatment, the allowable contact stress can reach 4000MPa, so it can be inferred that the rated static load of model 3020 roller lead screw can meet the requirements.

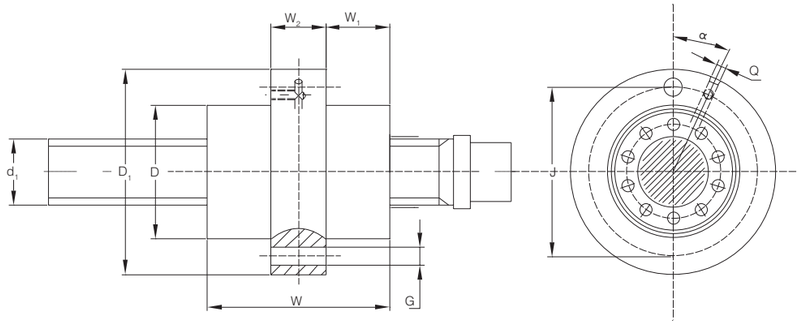
4. Numbering rules and meaning

GZ R F S 30×10 T R P3 / 590×425

- Lead screw length × thread length (mm)
- Lead accuracy: P1 ~ P5; T1 ~ T5; According to GB/T 17587.3 standard
- Direction of rotation R= right-handed; L= left-handed
- Special type T= Graph by customer
- Nominal diameter × lead; mm
- There is no pre-tightening: S= Nuts without pretightening (standard series) D= Pretighten nut gasket
- Nut type C= cylindrical nut F= nuts with flange in middle position P= The nut where the flange deviates from the middle position
- Product R= Standard planetary roller screw V= circulating planetary roller screw I= reverse planetary roller screw
- Planetary roller screw subcode

5. standard planetary roller screw by-product series

Standard planetary roller screw pair (GZR) with nut flange in center and no axial preload

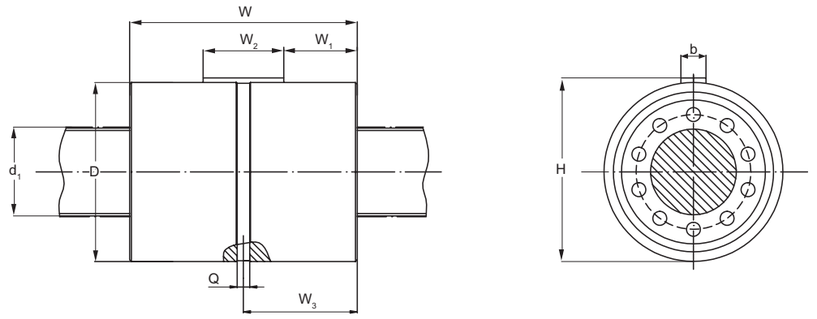


Unit: mm

Name	N① -	d_1 mm	D mm	W mm	W_1 mm	W_2 mm	D_1 mm	J mm	G mm	Q -	α °	C_a① kN	C_{oa}① kN
GZRFS 15×05	5	15.6	35	50	16	18	56	45	6×φ5.8	M6	30	28.2	51.5
GZRFS 15×08	5	15.5	35	50	16	18	56	45	6×φ5.8	M6	30	30.6	50.2
GZRFS 18×05	5	18.3	40	58	20	18	62	51	6×φ5.8	M6	30	35.3	65.9
GZRFS 18×06	5	18.4	40	58	20	18	62	51	6×φ5.8	M6	30	37	67
GZRFS 20×05	5	19.8	44	65	23	18	64	53	6×φ5.8	M6	30	46.4	97.5
GZRFS 20×10	5	20.2	44	65	23	18	64	53	6×φ5.8	M6	30	50.1	87.6
GZRFS 21×05	5	21.3	45	64	23	18	68	56	6×φ5.8	M6	30	58	100
GZRFS 21×10	5	21.7	45	64	23	18	68	56	6×φ5.8	M6	30	63.3	91.2
GZRFS 25×05	5	24.3	53	78	29	20	84	70	6×φ6.8	M6	30	72.8	133.7
GZRFS 25×10	5	24.7	53	78	29	20	84	70	6×φ6.8	M6	30	84.2	129.2
GZRFS 27×05	5	27.3	55	79	29	20	83	68	6×φ6.8	M6	30	88	171
GZRFS 27×10	5	27.7	55	79	29	20	83	68	6×φ6.8	M6	30	100	166
GZRFS 30×05	5	30.3	64	85	29	27	97	81	6×φ9	M6	30	88.4	168.1
GZRFS 30×10	5	30.7	64	85	29	27	97	81	6×φ9	M6	30	106.3	174.4
GZRFS 30×20	5	31.4	64	85	29	27	97	81	6×φ9	M6	30	123.3	177.3
GZRFS 36×5	5	36.3	74	96	33	30	110	92	6×φ9	M6	30	123.6	268.8
GZRFS 36×8	5	36.4	74	96	33	30	110	92	6×φ9	M6	30	139.2	266.4
GZRFS 36×10	5	36.7	74	96	33	30	110	92	6×φ9	M6	30	148.4	273.6
GZRFS 36×6	6	36.3	68	80	26.5	27	102	85	6×φ9	M6	30	90.5	179
GZRFS 36×12	6	36.7	68	80	26.5	27	102	85	6×φ9	M6	30	97.5	174
GZRFS 39×05	5	39.3	80	100	33.5	33	124	102	6×φ11	M6	30	129.2	268.9
GZRFS 39×10	5	39.7	80	100	33.5	33	124	102	6×φ11	M6	30	152.6	270.9
GZRFS 39×15	5	40	80	100	33.5	33	124	102	6×φ11	M6	30	167.6	272.9
GZRFS 39×20	5	40.4	80	100	33.5	33	124	102	6×φ11	M6	30	172.8	260.9
GZRFS 42×05	5	42.3	86	118	41.5	35	130	109	6×φ11	M6	30	158.4	343.4
GZRFS 42×10	5	42.7	86	118	41.5	35	130	109	6×φ11	M6	30	185.3	341.2
GZRFS 48×05	5	48 .3	100	127	45	37	150	127	6×φ13.5	M8×1	30	195.6	482.3
GZRFS 48×08	5	48.4	100	127	45	37	150	127	6×φ13.5	M8×1	30	218.2	471.6
GZRFS 48×10	5	48.7	100	127	45	37	150	127	6×φ13.5	M8×1	30	231.5	475.1
GZRFS 48×15	5	49	100	127	45	37	150	127	6×φ13.5	M8×1	30	257.8	486.4
GZRFS 48×20	5	49.4	100	127	45	37	150	127	6×φ13.5	M8×1	30	265.7	462.3
GZRFS 48×06	6	48.3	88	99	32	35	122	104	6×φ11	M8×1	30	169	436
GZRFS 48×12	6	48.7	88	99	32	35	122	104	6×φ11	M8×1	30	185	435
GZRFS 48×20	6	49	88	99	32	35	122	104	6×φ11	M8×1	30	212	412
GZRFS 48×24	6	49.2	88	99	32	35	122	104	6×φ11	M8×1	30	255	448
GZRFS 51×05	5	51.3	102	139	52	35	147	124	6×φ13.5	M8×1	30	256	640
GZRFS 60×10	5	60.7	122	152	53.5	45	180	150	6×φ17.5	M8×1	30	338.6	779.7
GZRFS 60×15	5	61	122	152	53.5	45	180	150	6×φ17.5	M8×1	30	373	783
GZRFS 60×20	5	61.4	122	152	53.5	45	180	150	6×φ17.5	M8×1	30	395	785.7
GZRFS 60×25	5	61.8	122	152	53.5	45	180	150	6×φ17.5	M8×1	30	405	817
GZRFS 75×10	5	75.7	150	191	73	45	210	180	8×φ17.5	M8×1	22.5	505	1486
GZRFS 75×15	5	76	150	191	73	45	210	180	8×φ17.5	M8×1	22.5	560	1490
GZRFS 75×20	5	76.4	150	191	73	45	210	180	8×φ17.5	M8×1	22.5	572	1495

① : Ca - dynamic load rating; Coa - static load rating; N - Number of threads

Nut flangeless, non-axial preload planetary roller screw pair (GZR) product line



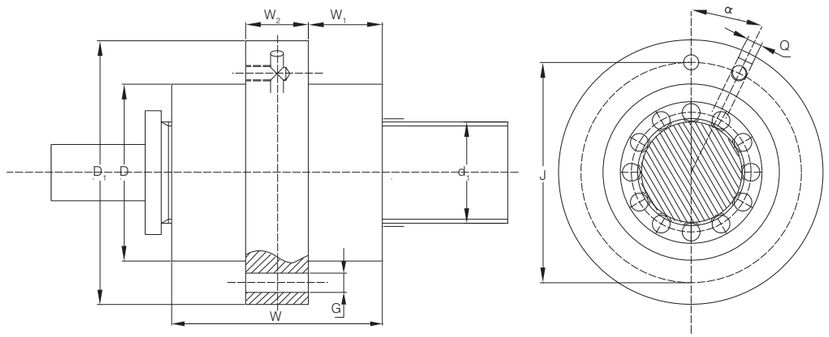
Unit: mm

Name	N① -	d_1 mm	D mm	W mm	W_1 mm	W_2 mm	W_3 mm	H mm	b mm	Q mm	C_a① kN	C_{oa}① kN
GZRCS 15×05	5	15.6	35	50	17	16	25	36.5	4	5	28.2	51.5
GZRCS 15×08	5	15.5	35	50	17	16	25	36.5	4	5	30.6	50.2
GZRCS 18×05	5	18.3	40	58	20	18	29	42	5	5	35.3	65.9
GZRCS 18×06	5	18.4	40	58	20	18	29	42	5	5	37	67
GZRCS 20×05	5	19.8	44	65	22.5	20	32.5	46	5	5	46.4	97.5
GZRCS 20×10	5	20.2	44	65	22.5	20	32.5	46	5	5	50.1	87.6
GZRCS 21×05	5	21.3	45	64	22.5	20	32.5	47	5	5	58	100
GZRCS 21×10	5	21.7	45	64	22.5	20	32.5	47	5	5	63.3	91.2
GZRCS 25×05	5	24.3	53	78	26.5	25	39	55.5	6	5	72.8	133.7
GZRCS 25×10	5	24.7	53	78	26.5	25	39	55.5	6	5	84.2	129.2
GZRCS 27×05	5	27.3	55	79	25.5	28	39.5	57.5	6	5	88	171
GZRCS 27×10	5	27.7	55	79	25.5	28	39.5	57.5	6	5	100	166
GZRCS 30×05	5	30.3	64	85	26.5	32	42.5	66.5	6	5	88.4	168.1
GZRCS 30×10	5	30.7	64	85	26.5	32	42.5	66.5	6	5	106.3	174.4
GZRCS 30×20	5	31.4	64	85	26.5	32	42.5	66.5	6	5	123.3	177.3
GZRCS 36×05	5	36.3	74	96	30	36	48	76.5	6	5	123.6	268.8
GZRCS 36×08	5	36.4	74	96	30	36	48	76.5	6	5	139.2	266.4
GZRCS 36×10	5	36.7	74	96	30	36	48	76.5	6	5	148.4	273.6
GZRCS 36×06	6	36.3	68	80	27.5	25	40	70	5	5	90.5	179
GZRCS 36×12	6	36.7	68	80	27.5	25	40	70	5	5	97.5	174
GZRCS 39×05	5	39.3	80	100	30	40	50	83	8	7	129.2	268.9
GZRCS 39×10	5	39.7	80	100	30	40	50	83	8	7	152.6	270.9
GZRCS 39×15	5	40	80	100	30	40	50	83	8	7	167.6	272.9
GZRCS 39×20	5	40.4	80	100	30	40	50	83	8	7	172.8	260.9
GZRCS 42×05	5	42.3	86	118	36.5	45	59	89	8	7	158.4	343.4
GZRCS 42×10	5	42.7	86	118	36.5	45	59	89	8	7	185.3	341.2
GZRCS 48×05	5	48 .3	100	127	41	45	63.5	103	8	7	195.6	482.3
GZRCS 48×08	5	48.4	100	127	41	45	63.5	103	8	7	218.2	471.6
GZRCS 48×10	5	48.7	100	127	41	45	63.5	103	8	7	231.5	475.1
GZRCS 48×15	5	49	100	127	41	45	63.5	103	8	7	257.8	486.4
GZRCS 48×20	5	49.4	100	127	41	45	63.5	103	8	7	265.7	462.3
GZRCS 48×06	6	48.3	88	99	27	45	49.5	91	8	7	169	436
GZRCS 48×12	6	48.7	88	99	27	45	49.5	91	8	7	185	435
GZRCS 48×20	6	49	88	99	27	45	49.5	91	8	7	212	412
GZRCS 48×24	6	49.2	88	99	27	45	49.5	91	8	7	255	448
GZRCS 51×05	5	51.3	102	139	47	45	69.5	105	8	7	256	640
GZRCS 60×10	5	60.7	122	152	53.5	45	76	125	10	10.5	338.6	779.7
GZRCS 60×15	5	61	122	152	53.5	45	76	125	10	10.5	373	783
GZRCS 60×20	5	61.4	122	152	53.5	45	76	125	10	10.5	395	785.7
GZRCS 60×25	5	61.8	122	152	53.5	45	76	125	10	10.5	405	817
GZRCS 75×10	5	75.7	150	191	64	63	95.5	153	10	10.5	505	1486
GZRCS 75×15	5	76	150	191	64	63	95.5	153	10	10.5	560	1490
GZRCS 75×20	5	76.4	150	191	64	63	95.5	153	10	10.5	572	1495

① : Ca - dynamic load rating; Coa - static load rating; N - Number of threads

6. circulating planetary roller screw by-product series

Circular Planetary Roller Screw pair (GZV) with nut flange in center and no axial preload



Unit: mm

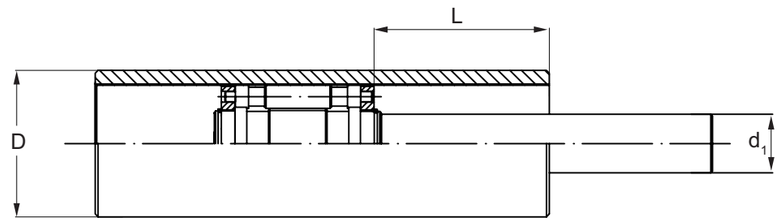
Name	N①	d_1	D	W	W_1	W_2	D_1	J	G	Q	α°	C_a①kN	C_{oa}①kN
*GZVFS 32×2	2	32	56	67	23.5	20	84	70	6×Φ6.6	M6	30	64.3	159.2
*GZVFS 40×2	2	40	68	84	28.5	27	102	85	6×Φ9	M6	30	49.9	117.2
*GZVFS 50×2	2	50	82	101	34	33	124	102	6×Φ11	M6	30	98.1	249.4

① : Ca - dynamic load rating; Coa - static load rating; N - Number of threads

Note: * indicates research and development

7. reverse planetary roller screw by-product series

The reverse planetary roller screw (GZI) series of nuts without axial preloading.



Unit: mm

Name	N①	D	d1max	行程S②	C_a①kN	C_{oa}①kN
*GZI1202	3	26	10	25	14.7	23.9
*GZI1206	3	26	10	20	24.3	27.3
*GZI1503	3	32	13	41	26.3	45.8
*GZI1505	3	32	13	36	29.8	44.9
*GZIS1508	3	32	13	31	32.2	41.8
*GZIS2403	3	50	21	60	61.6	162.3

① : Ca - dynamic load rating; Coa - static load rating; N - Number of threads

② Need a larger trip, please contact us;

Note: * indicates research and development

Precision linear motion spline series

Configuration and features

The spline is a kind of linear motion system. When spline motions along the precision ground Shaft by balls, the torque is transferred. The spline has compact structure. It can transfer the Over load and motive power. It has longer lifetime.

At present the factory manufacture two kinds of spline, namely convex spline and concave spline. Usually the convex spline can take bigger radial load and torque than concave spline.

Linear motion rolling spline,(shown as Fig.1) has three rails sharing in excircle of spline shaft, balls are running in certain six loading paths formed by bulge outs of the three rails and the respective sections of spline nut.

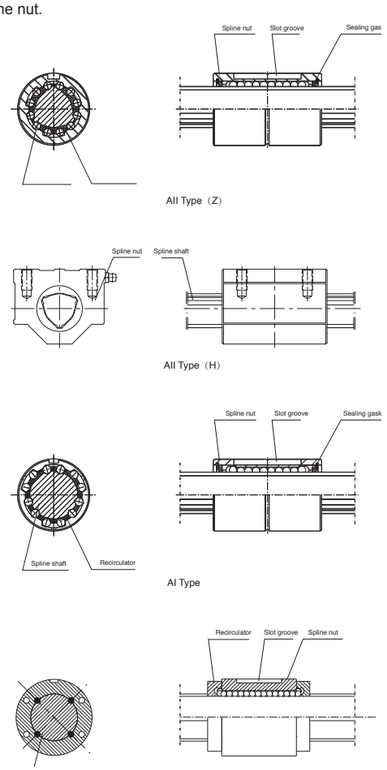


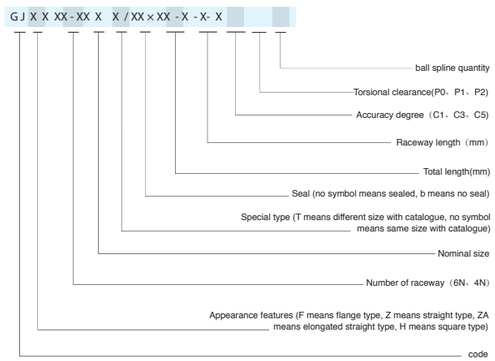
Fig.1

After finished process, radius of roller track slots is nearly R value as that of balls. When torsion force is pressed between the spline nut and the spline shaft, three torsion-oriented loading balls lines transform the force steadily and equally. When the orientation reverses, three other rows work . If a relative motion takes place between the shaft and the spline nut, balls will move back and forth between roller tracks and unload zone.

Spline shaft is made of high-grade alloy steel quenching HRC 58, and spline nut is made of high-grade alloy cementite steel quenching HRC 58, so long service life and hard intensity can be obtained.

Clearance of rotating direction can be controlled to zero value or interfere state, high-speed motion and rotating can be available, In addition, linear motion spline with compact structure is ease to assemble.

Code rule and connotation



Example:

(1) GJ AII F 6N-40/1000X500-C1-P0-1

Explain: Form is AII type, nominal dia. is ϕ40, appearance feature is flange type, 6 raceways, total length is 1000mm, raceway length is 500mm, accuracy grade is C1, ball spline with sealing device, normal preload, one spline sleeve.

(2) GJ R Z 6N-40 b/1000x1000-C5-P2-2

Explain: Form is R type, nominal dia. is ϕ40, appearance feature is straight type, 6 raceways, total length is 1000mm, raceway length is 1000mm, accuracy grade is C5, ball spline without sealing device, medium preload, 2 spline sleeves.

Accuracy grade

Spline series is divided into three accuracy grades, such as super as super-grade C1, precision grade C3 and common grade C5. Accuracy items see Fig.2. Allowable variation requirements of both axle necks of spline shaft are recommended for users.

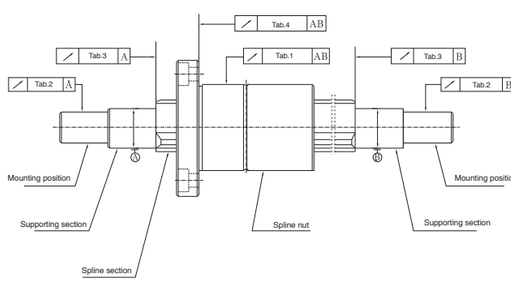


Fig.2

Tab.1 Radical circle jumping of spline nut surface toward axial line of supporting section

Unit: μm

Length \ Dia. / Accuracy	15 16 20			25 30 32			40 50			60 70 80			85 100 120			150		
	C1	C3	C5	C1	C3	C5	C1	C3	C5	C1	C3	C5	C1	C3	C5	C1	C3	C5
<200	18	34	56	18	32	53	16	32	53	16	30	51	16	30	51	—	—	—
200~315	25	45	71	21	39	58	19	36	58	17	34	55	17	32	53	—	—	—
315~400	—	53	83	25	44	70	21	39	63	19	36	58	17	34	55	—	—	—
400~500	—	—	95	29	50	78	24	43	68	21	38	61	19	35	57	19	36	46
500~630	—	—	112	34	57	88	27	47	74	23	41	65	20	37	60	21	39	49
630~800				42	68	103	32	54	84	26	45	71	22	40	64	24	43	53
800~1000				—	—	124	38	63	97	30	51	79	24	43	69	27	48	58
1000~1250							—	—	114	35	59	90	28	48	76	32	55	63
1250~1600							—	—	139	—	—	106	—	—	86	40	65	80
1600~2000													—	—	99	—	—	100

Table -2 The radial deviation of the outer circle of the mounting journal against the axis of the supporting journal

Unit: μm

Nominal axial dia. \ Accuracy grade	Precision	Super-precision	Common
	C1	C3	C5
15 16 20	12	19	46
25 30 32	13	22	53
40 50	15	25	62
60 70 80	17	29	73
85 100 120	20	34	86
150	23	40	100

Tab-3 The end deviation of the shaft facing the axis of the supporting journal

Unit: μm

Nominal axial dia. \ Accuracy grade	Precision	Super-precision	Common
	C1	C3	C5
15 16 20	8	11	27
25 30 32	9	13	33
40 50	11	16	39
60 70 80	13	19	46
85 100 120	15	22	54
150	18	25	63

Tab-4 Spline sleeve flange mounting face for the spline shaft axis of the axial deviation

Unit: μm

Spline sleeve with outer circle diameter D_1 (mm)		Accuracy		
>	≦	C1	C3	C5
—	18	8	11	27
18	30	9	13	33
30	50	11	16	39
50	80	13	19	46
80	120	15	22	54
120	180	18	25	63
180	250	20	29	72

Tab-5 The radial deviation of the spline sleeve with respect to the spline axis

Spline sleeve with outer circle diameter D_1 (mm)		Accuracy		
>	≦	C1	C3	C5
—	18	5	11	27
18	30	6	13	33
30	50	7	16	39
50	80	8	19	46
80	120	10	22	54
120	180	12	25	63
180	250	14	29	72

Tab.6 Torsion clearance of linear motion rolling spline

Unit: μm

Nominal axial dia. \ Accuracy grade	Common	Light-preload	Middle-preload
	P_0	P_1	P_2
15 16	±3	-9 ~ -3	-15 ~ -9
20 25 30 32	±4	-12 ~ -4	-20 ~ -12
40 50 60	±6	-18 ~ -6	-30 ~ -18
70 80 85	±8	-24 ~ -8	-40 ~ -24
100 120 150	±10	-30 ~ -10	-50 ~ -30

Note: "—"represents interference value.

Tab.7 Applications of Rolling spline

Unit: μm

Torsion clearance	Service conditions	Application casee
P_2	High rigidity required in situations of impacts or vibration	Spot welding shaft, tools carriers, indexing shaft
P_1	Used in lightly impact or vibration conditions of light moment of suspension arm	Rockers of automatic robots, main axle of kinds of reloading machines, painting dressing
P_0	Used for torsion supporting section of certain orientation, easy moving with small force	Measuring devices, main axle of machines such as: automatic draught machines, automatic reels, packing machines and plate benders

Tab.8 Load coefficient fw

Unit: μm

Impact and vibration	Speed	f_w
No impact, light vibration	V≤15m/min	1.0~1.5
Light impact	V>15~60m/min	1.5~2.0
Impact conditions	V>60m/min	2.0~3.5

Tab.9 Contact coefficient fc

Unit: μm

Number of spline nut	f_c
1	1.00
2	0.81
3	0.72
4	0.66
5	0.61

Tab.10 Temperature coefficient fT

Unit: μm

Temperature of linear motion system	≤100°C	100°C~150°C	150°C~ 200°C
f_T	1	1~0.9	0.9~0.75

Service life calculation

From formula: $L = 50(\frac{f_T \cdot f_C \cdot f_H \cdot C_T}{f_w T_C})^3$ rated service life with certain bearing torsion is calculated. Within certain travel distance and travel times, the service life with single bearing torsion can be calculated from the equation below:

$$L_h = \frac{L \times 10^3}{120\ L_S n_1}$$

L— Rated service life (KM)

fw— Load coefficient (Tab.7)

fc— Contact coefficient (Tab.8)

fT— Temperature coefficient (Tab.9)

fH— Hardness coefficient

$$f_H = \frac{(\text{Actual, HRC})^{3.6}}{\text{HRC58}}$$

CT— Rated torsion value (N-m)

Tc— Calculated torsion (N-m)

Lh— Service life (hr)

Ls— Travel distance (m)

n1— Return times per minute (opm)

GJAIIZ roll spline subdimension series

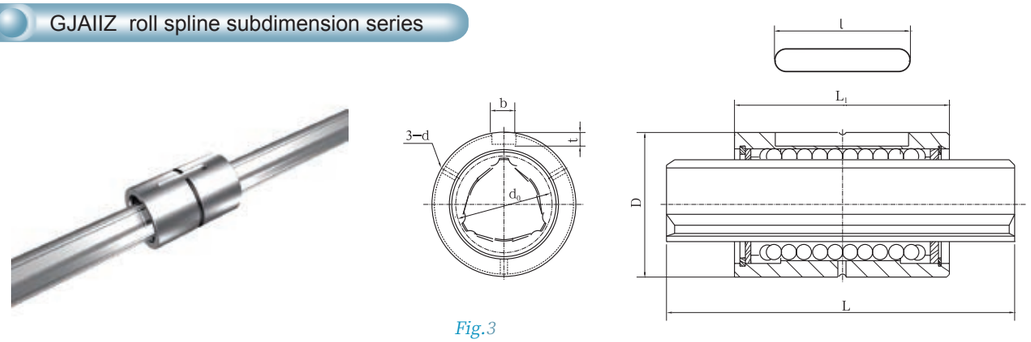


Fig.3

Tab.10 *Unit: mm*

Code and type	Nominal axial dia. d0	External dia. D	Length of spline nut L1	Max. length of shaft L	Width of slot groove b	Depth of slot groove t	Length of slot groove l	Oil hole d	Standard rated torque		Basic rated load	
									Dynamic torsion N-m	Stationary torsion N-m	Dynamic load C KN	Static load C_o KN
GJIIZ15	15	23 0 -0.013	40 0 -0.3	400	3.5H8	2 0 -0.3	20	2	27.8	65.2	3.9	8.1
GJIIZ20	20	30 0 -0.013	50 0 -0.3	600	4H8	2.5 +0.1 0	26	3	62.3	135.2	6.6	12.7
GJIIZ25	25	38 0 -0.016	60 0 -0.3	800	5H8	3 +0.2 0	36	3	127.3	268.3	10.9	20.2
GJIIZ30	30	45 0 -0.016	70 0 -0.3	1400	6H8	3 +0.2 0	40	3	155.7	318.7	11.1	20
GJIIZ32	32	48 0 -0.016	70 0 -0.3	1400	8H8	4 +0.2 0	40	3	236.4	459.9	15.8	27.1
GJIIZ40	40	60 0 -0.019	90 0 -0.3	1500	10H8	5 +0.2 0	56	4	548	1081.9	29.3	50.9
GJIIZ50	50	75 0 -0.019	100 0 -0.3	1500	14H8	5.5 +0.2 0	60	4	880.6	1711.6	37.7	64.5
GJIIZ70	70	100 0 -0.022	110 0 -0.3	1700	18H8	6 +0.1 0	68	2	2488	4141.1	76.1	111.5
GJIIZ85	85	120 0 -0.022	140 0 -0.3	1900	20H8	7 +0.1 0	80	3	3978	6927.4	100.2	153.6
GJIIZ100	100	140 0 -0.025	160 0 -0.4	1900	28H8	9 +0.1 0	93	3	6905.9	11737.2	147.9	221.3

GJAIIZA Heavy-duty type spline subdimension series

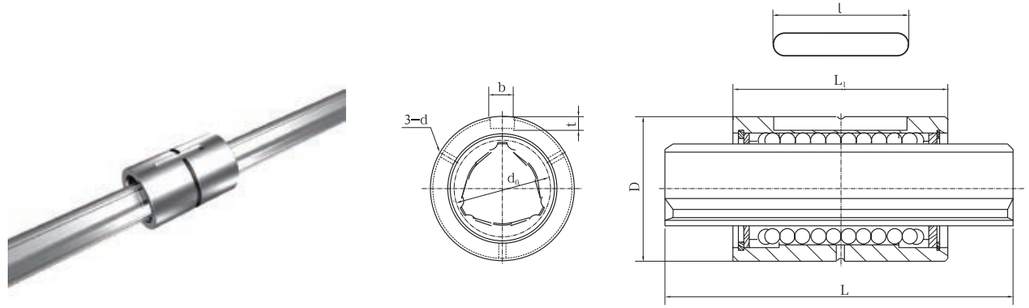
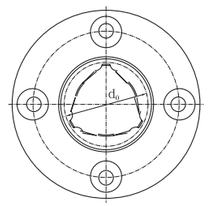


Fig. 4

Tab. 11 *Unit: mm*

Code and type	Nominal axial dia. d0	External dia. D	Length of spline nut L1	Max. length of shaft L	Width of slot groove b	Depth of slot groove t	Length of slot groove l	Oil hole d	Standard rated torque		Basic rated load	
									Dynamic torsion N-m	Stationary torsion N-m	Dynamic load C KN	Static load C_o KN
GJIIZA15	15	23 0 -0.013	50 0 -0.3	400	3.5H8	2 0 -0.3	20	2	38.9	105.9	5.5	13.3
GJIIZA20	20	30 0 -0.013	60 0 -0.3	600	4H8	2.5 +0.1 0	26	3	100	270.5	10.719	25.499
GJIIZA25	25	38 0 -0.016	70 0 -0.3	800	5H8	3 +0.2 0	36	3	152.0	345.0	13	26
GJIIZA30	30	45 0 -0.016	80 0 -0.3	1400	4H8	3 +0.2 0	26	3	192.2	425.8	16.3	33.1
GJIIZA32	32	48 0 -0.016	80 0 -0.3	1400	8H8	4 +0.2 0	40	3	288.9	613.2	19.3	36.1
GJIIZA40	40	60 0 -0.019	100 0 -0.3	1500	10H8	5 +0.2 0	56	4	651.9	1390.9	34.9	65.5
GJIIZA50	50	75 0 -0.019	112 0 -0.3	1500	14H8	5.5 +0.2 0	60	4	1048.0	2200.7	44.9	82.9
GJIIZA60	60	90 0 -0.022	127 0 -0.3	1500	16H8	6 +0.2 0	70	4	2135.9	4172.9	76.2	131.1
GJIIZA70	70	100 0 -0.022	135 0 -0.3	1700	18H8	6 +0.1 0	68	4	3153.4	5797.6	96.5	156.1
GJIIZA85	85	120 0 -0.022	155 0 -0.3	1900	20H8	7 +0.1 0	80	5	4437.2	8082.0	111.8	179.2
GJIIZA100	100	140 0 -0.025	175 0 -0.4	1900	28H8	9 +0.1 0	93	5	6943.8	11737.2	148.7	221.3
GJIIZA120	120	160 0 -0.025	200 0 -0.4	1900	28H8	9 +0.1 0	123	6	10153.5	18779.5	181.3	295
GJIIZA150	150	205 0 -0.029	250 0 -0.4	1900	32H8	10 +0.1 0	157	6	19564.1	33532.7	279.4	421.5

GJAIIF roll spline subdimension series



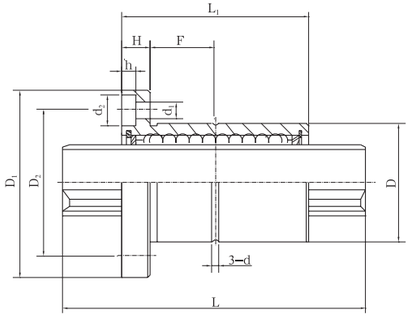


Fig. 5

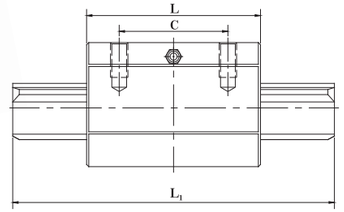
Tab. 12

Unit: mm

Code and type	Nominal axial dia. d_0	External dia. D		Length of spline nut L_1		Max. length of shaft L	Dia. of flange D_1	Dia. of center circle of mounting D_2		Thickness of flange H	Depth of counter bore h	Oil hole d	Dia. of counter bore d_2	Dia. of cross hole d_1	Position of oil hole F	Standard rated torque		Basic rated load	
																Dynamic torsion N-m	Stationary torsion N-m	Dynamic load C KN	Static load C_o KN
GJA II Z15	15	23	0 -0.013	40	0 -0.3	400	3.5H8	2	0 -0.3	20	2	27.8	65.2	3.9	8.1	27.8	65.2	3.9	8.1
GJA II Z20	20	30	0 -0.013	50	0 -0.3	600	4H8	2.5	+0.1 0	26	3	62.3	135.2	6.6	12.7	62.3	135.2	6.6	12.7
GJA II Z25	25	38	0 -0.016	60	0 -0.3	800	5H8	3	+0.2 0	36	3	127.3	268.3	10.9	20.2	127.3	268.3	10.9	20.2
GJA II Z30	30	45	0 -0.016	70	0 -0.3	1400	6H8	3	+0.2 0	40	3	155.7	318.7	11.1	20	155.7	318.7	11.1	20
GJA II Z32	32	48	0 -0.016	70	0 -0.3	1400	8H8	4	+0.2 0	40	3	236.4	459.9	15.8	27.1	236.4	459.9	15.8	27.1
GJA II Z40	40	60	0 -0.019	90	0 -0.3	1500	10H8	5	+0.2 0	56	4	548	1081.9	29.3	50.9	548.0	1081.9	29.3	50.9
GJA II Z50	50	75	0 -0.019	100	0 -0.3	2250	14H8	5.5	+0.2 0	60	4	880.6	1711.6	37.7	64.5	880.6	1711.6	37.7	64.5
GJA II Z70	70	100	0 -0.022	110	0 -0.3	2750	18H8	6	+0.2 0	68	4	2488	4141.1	76.1	111.5	2135.9	4172.9	76.2	131.1
GJA II Z85	85	120	0 -0.022	140	0 -0.3	2750	20H8	7	+0.2 0	80	5	3978	6927.4	100.2	153.6	3153.4	5797.6	96.5	156.1
GJA II Z100	100	140	0 -0.025	160	0 -0.4	2750	28H8	9	+0.2 0	93	5	6905.9	11737.2	147.9	221.3	4437.2	8082.0	111.8	179.2
GJAIIF100	100	135	0 -0.025	160	0 -0.4	1900	195	0 -0.4	162	25	17.5	5	26	18	55	6905.9	11737.2	147.9	221.3

Note: Spline pair has special requirements can be special order

GJAIIH roll spline subdimension series



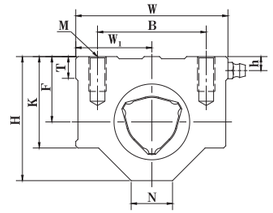


Fig. 6

Tab. 13

Unit: mm

Code and type	H	W	L	Max. length of shaft L_1	F	W_1	B	C	M	K	N	T	h	Oil cup	Standard rated torque		Basic rated load	
															Dynamic torsion N-m	Stationary torsion N-m	Dynamic load C KN	Static load C_o KN
GJAIIH15	29	34	40	400	15±0.1	17±0.1	26	26	M4 depth 10	23	9	6	5	ø4 forced filling	38.9	105.9	5.5	13.3
GJAIIH20	38	48	60	600	20±0.1	24±0.1	35	35	M6 depth 12	29	12	7	6	straight-through M6	100	270.5	10.7	25.4
GJAIIH25	47	60	70	800	25±0.1	30±0.1	40	40	M8 depth 14	35	16	10	7	straight-through M6	152.0	345.0	13.0	26.0
GJAIIH30	57	70	80	1400	30±0.1	35±0.1	50	50	M8 depth 16	42	19	10	7	straight-through M6	288.9	613.2	19.3	36.1
GJAIIH40	70	86	102	1500	38±0.1	43±0.1	60	60	M10 depth 20	58	26	15	10	straight-through M6	1048.0	2200.7	34.9	65.5
GJAIIH50	86	100	112	1500	48±0.1	50±0.1	75	75	M12 depth 20	74	32	15	10	straight-through M6	2135.9	4172.9	44.9	82.9

GJAIZ type rolling spline subdimension series

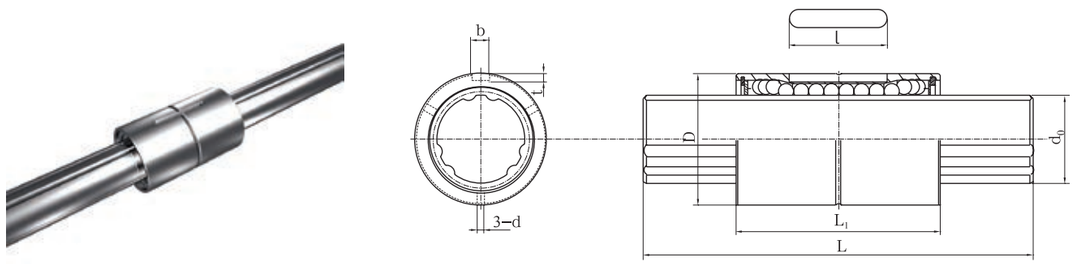


Fig. 7

Tab. 14

Unit: mm

Code and type	Shaft dia. d_0(h7)		External dia. D(h6)		Length of spline nut L_1		Max. length of shaft L	Width of slot groove b	Depth of slot groove t		Length of slot groove l	Oil hole d	Standard rated torque		Basic rated load	
													Dynamic torsion N-m	Stationary torsion N-m	Dynamic load C KN	Static load C_o KN
GJAZG16	16	0 -0.018	31	0 -0.016	50	0 -0.2	500	3.5H8	2	+0.1 0	17.5	2	32	30	7.5	15.6
GJAZG20	20	0 -0.021	35	0 -0.016	63	0 -0.2	600	4H8	2.5	+0.1 0	29	2	55	55	10.1	24.7
GJAZG25	25	0 -0.021	42	0 -0.016	71	0 -0.3	800	4H8	2.5	+0.1 0	36	3	103	105	13.7	30.1
GJAZG30	30	0 -0.021	48	0 -0.016	80	0 -0.3	1400	4H8	2.5	+0.1 0	40	3	148	171	17.1	37.1
GJAZG40	40	0 -0.025	64	0 -0.019	100	0 -0.3	1500	6H8	3.5	+0.1 0	52	4	375	415	32.1	70.2
GJAZG50	50	0 -0.025	80	0 -0.019	125	0 -0.3	1500	8H8	4	+0.2 0	58	4	760	840	49.4	104.9
GJAZG60	60	0 -0.03	90	0 -0.022	140	0 -0.3	1500	12H8	5	+0.2 0	67	5	1040	1220	64.2	128.2
GJAZG80	80	0 -0.03	120	0 -0.022	160	0 -0.4	1700	16H8	6	+0.2 0	76	5	1920	2310	87.3	170.7
GJAZG100	100	0 -0.035	150	0 -0.025	190	0 -0.4	1900	20H8	7	+0.2 0	110	5	3010	3730	109.9	222
GJAZG120	120	0 -0.035	180	0 -0.025	220	0 -0.4	1900	32H8	11	+0.2 0	120	6	4100	5200	176.5	347

Note: Spline has special requirements can be special order

GJAIF type rolling spline subdimension series

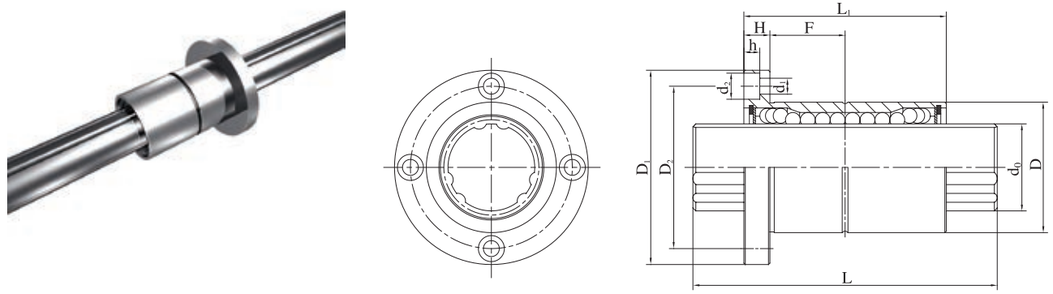


Fig. 8

Tab. 15

Unit: mm

Code and type	Shaft dia. d_0(h7)		External dia. D(h6)		Length of spline nut L_1		Max. length of shaft L	Dia. of flange D_1		Dia. of center circle of mountin D_2	Thick-ness of flange H	Depth of counter bore h	Dia. of counter bore d_2	Dia. of cross hole d_1	Oil hole d	Position of oil hole F	Standard rated torque		Basic rated load	
																	Dynamic torsion N-m	Stationary torsion N-m	Dynamic load C KN	Static load C_o KN
GJAIF16	16	0 -0.018	31	0 -0.016	50	0 -0.2	500	51	0 -0.2	40	7	4.4	8	4.5	2	18	32	30	7.5	15.6
GJAIF20	20	0 -0.021	35	0 -0.016	63	0 -0.2	600	58	0 -0.2	45	9	5.4	9.5	5.5	2	22.5	55	55	10.1	24.7
GJAIF25	25	0 -0.021	42	0 -0.016	71	0 -0.3	800	65	0 -0.3	52	9	5.4	9.5	5.5	3	26.5	103	105	13.7	30.1
GJAIF30	30	0 -0.021	48	0 -0.016	80	0 -0.3	1400	75	0 -0.3	60	10	6.5	11	6.6	3	30	148	171	17.1	37.1
GJAIF40	40	0 -0.025	64	0 -0.019	100	0 -0.3	1500	100	0 -0.3	82	14	8.6	14	9	4	36	375	415	32.1	70.2
GJAIF50	50	0 -0.025	80	0 -0.019	125	0 -0.3	1500	124	0 -0.3	102	16	11	17.5	11	4	46.5	760	840	49.4	104.9
GJAIF60	60	0 -0.03	90	0 -0.022	140	0 -0.3	1500	134	0 -0.3	112	16	11	18	11	5	54	1040	1220	64.2	128.2
GJAIF80	80	0 -0.03	120	0 -0.022	160	0 -0.4	1700	168	0 -0.3	144	20	12.8	20	13.5	5	60	1920	2310	87.3	170.7
GJAIF100	100	0 -0.035	150	0 -0.025	190	0 -0.4	1900	200	0 -0.3	170	25	16.8	26	17.5	5	70	3010	3730	109.9	222
GJAIF120	120	0 -0.035	180	0 -0.025	220	0 -0.4	1900	252	0 -0.3	216	30	20.6	32	22	6	80	4100	5200	176.5	347

GJRZ type rolling spline subdimension series

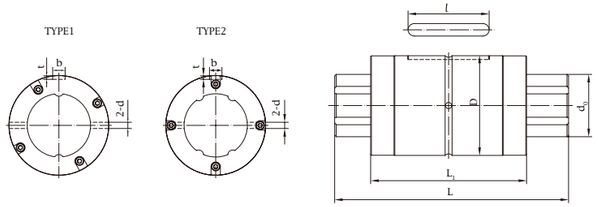


Fig-9

Tab-17 Unit: mm

Specification and model	Outside diameter of shaft d_0(h7)	Outside diameter D(h6)	Sleeve length L_1	Maximum shaft length L	Width of keyway b	Keyway depth t	Keyway length l	Oil hole d	TYPE	Basic rated torque		Basic load rating	
										Dynamic torque C_T N-m	Static torque C_{0T} N-m	Basic dynamic load C(kN)	Basic static load C_0(kN)
GJRZ16	16	31	50(0,-0.2)	500	3.5H8	$2^{+0.1}_{0}$	17.5	2	1	41.6	57.2	5.2	7.2
GJRZ20	20	35	56(0,-0.2)	600	4H8	$2.5^{+0.1}_{0}$	29	2		68.9	93.0	7.0	9.4
GJRZ25	25	42	71(0,-0.3)	800	4H8	$2.5^{+0.1}_{0}$	36	3	2	190	326.8	9.5	13.3
GJRZ30	30	48	80(0,-0.3)	1400	4H8	$2.5^{+0.1}_{0}$	40	3		357.2	482.0	11.0	16.6
GJRZ40	40	64	100(0,-0.3)	1500	6H8	$3.5^{+0.2}_{0}$	52	4		885.1	1347.4	28.3	34.1
GJRZ50	50	80	125(0,-0.3)	2250	8H8	$4^{+0.2}_{0}$	58	4		1504.7	2319.1	38.8	47.4

Note: Spline has special requirements can be special order

GJRF type rolling spline subdimension series

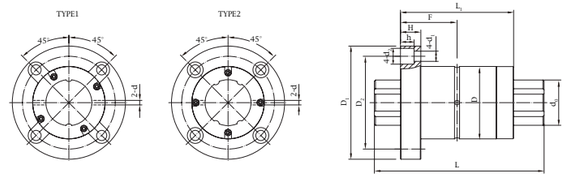


Fig-10

Tab-18 Unit: mm

Specification and model	Outside diameter of shaft d_0(h7)	Outside diameter D(h6)	Sleeve length L_1	Maximum shaft length L	Flange diameter D_1	Center of mounting hole D_2	Flange thickness H	Countersink depth h	Countersink diameter d_2	Through-hole diameter d_1	Oil hole d	Oil hole positio F	TYPE	Basic rated torque		Basic load rating	
														Dynamic torque C_T N-m	Static torque C_{0T} N-m	Basic dynamic load C(kN)	Basic static load C_0(kN)
GJRF16	16	31	50(0,-0.2)	500	51(0,-0.2)	40	10	6	8	4.5	2	18	1	41.6	57.2	5.2	7.2
GJRF20	20	35	56(0,-0.2)	600	58(0,-0.2)	45	10	5.4	9.5	5.5	2	18		68.9	93	7	9.4
GJRF25	25	42	71(0,-0.3)	800	65(0,-0.3)	52	13	8	9.5	5.5	3	26.5	2	190	326.8	9.5	13.3
GJRF30	30	48	80(0,-0.3)	1400	75(0,-0.3)	60	13	8	11	6.6	3	30		357.2	482	11	16.6
GJRF40	40	64	100(0,-0.3)	1500	100(0,-0.3)	82	18	12	14	9	4	32		885.1	1347.4	28.3	34.1
GJRF50	50	80	125(0,-0.3)	2250	124(0,-0.3)	102	20	12	18	11	4	42.5		1504.7	2319.1	38.8	47.4

Note: Spline has special requirements can be special order

Precautions for use

Spline shaft requirements for shaft end structure

Figure -11 shows the section shape of the spline shaft, when the shaft end needs to be machined, d1 < d (see Table -19, Table 20, Table 21).

Tab-18 AII Type

Nominal diameter	15	20	25	30	32	40	50	60	70	85	100	120	150
d	11.1	14.8	18.5	22	23.5	30	38	45.5	53.3	66.3	78.5	97.5	120.3
D	14.4	19.5	24	29.2	31	38.5	48.5	57.8	69	82	98	117	147

Tab-19 AI Type

Nominal diameter	16	20	25	30	40	50	60	80	100	120
d	14.3	18.1	22.5	27.3	36.27	46	54.5	73.5	94.1	112.1
D	16	20	25	30	40	50	60	80	100	120

Tab-20 R Type

Nominal diameter	16	20	25	30	40	50
d	14.1	18	23	28	36.7	46.5
D	16	20	25	30	40	50

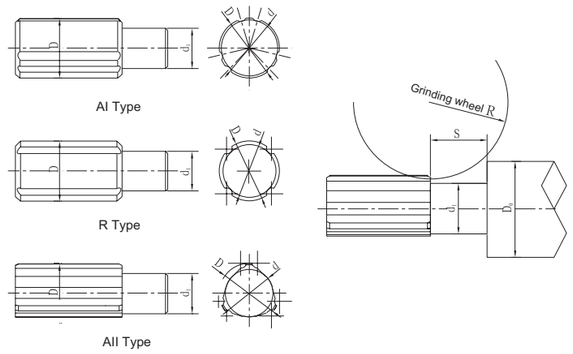


Fig. 10

Note: R=40~150. Usually small size means low accuracy grade.

$$S \geqslant 1.2\sqrt{R\,(D_0 - d)}$$

Configuration and mounting of spline nut

◆ The correct mounting method is to keep slot groove of spline nut horizontal with mounting holes of flange.

Spline nut's slot grooves of GJZ type, GJZA type and GJZG type, Shown as Fig. 9(a), lie right two bearing balls lines.

(a) GJZ, GJZA, GJZG type mounting section

(b) GJF, GJFG type flange mounting section

(c) GJZD mounting section

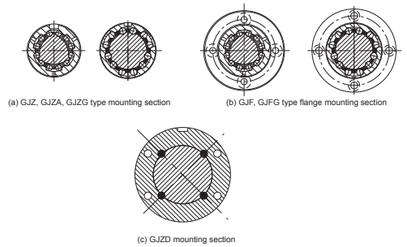


Fig. 11

One of the four mounting holes of the GJF type and GJFG flange is aimed to one bulge of spline, shown as Fig.11(b). If there is any special request for slot groove, please consult with us.

◆ Mounting of spline nut

When fit spline nut to mounting base, please push it in with proper tooling. Do not touch side plate and sealing gasket. Tool di front end faceoff angle 2×30°.

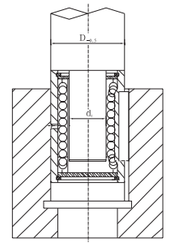


Fig. 12

size of proper tooling

Tab. 21 Application of convex spline

Nominal axial dia.	15	20	25	30	32	40	50	60	70	85	100	120	150
D	23	30	38	45	48	60	75	90	100	120	140	160	205
d_1	11.6h9	15.3h9	19h9	22.5h9	24h9	30.5h9	38.5h9	46h9	53.8h9	66.8h9	79h9	98h9	120.8h9

Tab. 22 Application of concave spline

Nominal axial dia.	16	20	25	30	40	50	60	80	100	120
D	16	20	25	30	40	50	60	80	100	120
d_1	14.8h9	18.6h9	23h9	27.8h9	36.77h9	46.5h9	55h9	74h9	94.6h9	112.6h9

Tab. 23 Application of GJZD spline

Nominal axial dia.	15	32	40	50	60
D	12.5	31	39	50	58.5
d_1	11	27.24 h9	35 h9	43.65 h9	52.86 h9

◆ Assemble axle with spline nut

When fit spline shaft with spline nut, pay attention to watch that matchmarks to avoid mistake. No permission fitting with reckless force. Lubrication oil is recommended for external diameter of main axle. Shown as Fig.13.

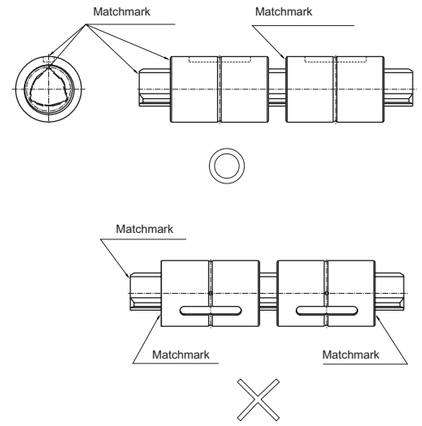


Fig. 13

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