THE WORLD IN MOTION

THK
The Mark of Linear Motion

www.rolman.com
THK’s creative ideas and unique technology made the company worldwide pioneers in the development of the Linear Motion (LM) Guide mechanism. Today, our LM Guide devices are an indispensable component of mechanical and electronic systems in a wide variety of industries. THK has also developed many other unique mechanical components, including the Ball Spline, Ball Screws and Link Balls, which are manufactured by us for supply to customers worldwide.

Our company name “THK” stands for “Toughness”, “High Quality” and “Know-how”. We aim to contribute to the improvement of society and development of industry by focusing on these three principles in our technology development and product manufacturing processes.

**LINEAR MOTION PRODUCTS**

**LM GUIDE (LINEAR MOTION GUIDE)**

- **Caged Ball/Roller LM Guide (Linear Motion Guide)**
  - ○ SR, SPS
  - ○ SRS, SSR, SHW, SCS, SCR, EPF, SVK/SY

**Caged Ball/ Roller LM Guide (Linear Motion Guide)**

- ○ SPS, SPS/SPS realize superior low wear, comparable to hydrostatic guides. In addition, the deformation of the ball is minimized to achieve ultra-high rigidity that surpasses even roller guides.
- ○ SPS, SPS/SPS, SHF, SCR, SFR, SPF

**LM GUIDE ACTUATOR**

- **Caged Ball LM Guide Actuator Model SRR**
  - This model achieves higher speed operation, lower noise and longer-term maintenance-free operation than the conventional type model KR by using ball cages in the LM Guide units and the Ball Screw unit.
- ○ LM Guide Actuator (Caged Ball type)
  - A series of various types are available from 1 mm to 25 mm in ball screw lead.

**LM ACTUATOR (LINEAR ACTUATOR)**

- **LM Actuator Model GL**
  - The LM Actuator comprises a standardized top table, drive system, and so on. The free selection of main parts from a rich collection of options enables users to realize specifications optimal for particular applications.
- ○ LM Actuator Long-term Maintenance-Free Type Model GL-A
  - Lightweight, high rigidity aluminium base with Caged Ball LM Guides has been utilized for the guide portion. A screw or belt options are available for the drive system. In addition, Caged Ball LM Guides and Caged Ball bearings are utilized to provide a long-term maintenance free actuator.
- ○ LM Actuator Model GL
  - Model GL is a single-axis actuator that allows a ball screw drive or a belt drive to be integrated with an aluminium base on which the LM Guide model GSR is mounted.

**LINEAR MOTION & ROTATING PRODUCTS**

**BALL SPINE**

- ○ Caged Ball Spine SCS/SLL
  - The adoption of the ball cage enables the circulating motion of evenly spaced balls to be maintained and high speed response to be achieved. In addition, it eliminates collision and mutual friction between balls, and realizes low noise, pleasant running sound and low particle generation. As the grease retention is increased, long-term maintenance-free operation is also realized.
- ○ High Torque Model LBS
  - This Ball Spline has no angular backlash to increase the rigidity by providing a preload with one spline nut since the spline shaft has 3 crests equidistantly arranged at 120 degrees on the circumference, each held by 2 rows (6 rows in total) of balls under a load.
- ○ Medium Torque Model LT
  - This Ball Spline has a large load capacity in the radial and torque directions since the spline shaft has 2 to 3 crests on the circumference, each held by 2 rows (4 or 6 rows in total) of balls under a load in order to reasonably provide a preload.
- ○ Rotary with Gears Model LBG
  - This model is a unit type that has gear teeth on the flange circumference, and radial and thrust needle bearings compactly integrated on the spline nut. This Ball Spline is optimal for a torque transmission mechanism with spline nut drive.
- ○ Rotary Model LTR
  - This model is a compact unit type of Ball Spline whose support bearings are directly integrated with the outer surface of the spline nut.
LINEAR MOTION PRODUCTS

LINEAR BUSHING

The Linear Bush is a linear guide used in combination with a LM shaft that has a cylindrical shape. This product makes linear movements with a minimum of frictional resistance to provide highly accurate and stable movement.

- Linear Bushing flanged type Models LMK, LMK-M, LMK, LMK-L, LMK-M1, LMK-M2, LMK-M3, LMK-M4

The nut is integrated with a flange. This enables this model to be directly mounted onto the housing with bolts, thus achieving easy installation.

- Linear Bushing Models SC, SL, SH, SHL

Since the small, lightweight aluminium casing contains one unit of model LM and two units of model SL, it can easily be mounted simply by securing it with the table using bolts.

- LM Shaft Support SK

An aluminium-made light fulcrum for securing an LM shaft. Since the LM shaft-mouting section has a slit, the fulcrum is capable of firmly securing an LM shaft using bolts.

LM STROKE

The LM Stroke is a linear guide of a type with limited strokes that can provide rolling guidance for rotational and reciprocating motions. With a very small frictional coefficient, the LM Stroke provides a compact, highly precise guiding mechanism at an inexpensive price.

- LM Stroke Model ST

A standard type and a seal type are available. In addition, each of both is divided into light-load and medium-load types.

- Miniature Stroke Model MST

A ball-based precision rolled bearing capable of performing linear motion, rolling motion and a combination of both.

- Die-setting Ball Cage Model KS/B

A ball cage mainly used in the guide of precision die-setting guide posts, and capable of easily following high-speed reciprocating motion.

PRECISION LINEAR PACK

The Precision Linear Pack is a superbly thin and lightweight linear guide. It is most suitable for precision measuring devices, semiconductor manufacturing and inspection equipment, and other applications where accurate linear motion is essential.

- With Rack Model LSP

Its cage, based on that of model LS, has a rack and pinion mechanism, thereby preventing the cage from slipping.

- Without Rack Model LS

A highly corrosion resistant slide unit with an extremely small frictional coefficient.

CROSS ROLLER GUIDE

The Cross Roller Guide is a limited stroke linear guide that has precision rollers orthogonalized alternately. This product provides rigid yet supple linear motion and is particularly suitable for linear guidance where high rigidity and supple movement is demanded.

- With Rack Model LCS

This base contains an eccentric cam for drive. Feeding air from the base or the side face of the base allows the slide to perform reciprocating motion.

CROSS ROLLER TABLE

The Cross Roller Table is a compact, high-precision, high-rigidity, limited linear guide unit with built-in cross roller guide. Easily installed with bolts, this product provides a high accuracy linear guiding mechanism.

- Base top Model VRK

A miniature type whose base has mounting holes. All stainless steel for high corrosion resistance, model VRK-M is also offered as a series.

- Mounting Hole Model VRK-A

A miniature type whose base has mounting holes. All stainless steel for high corrosion resistance, model VRK-A is also offered as a series.

- Mounting Hole Model VRK-U

With this type, a Cross Roller Guide is incorporated between the table and the base, both of which are machined to high accuracy.

LINEAR BALL SLIDE

The Linear Ball Slide is a lightweight, compact, limited stroke linear guide unit that operates with very low sliding resistance. It excels in high-speed responsive performance due to its very small frictional factor and low inertia.

- With Rack Model FBL

Its cage, based on that of model LS, has a rack and pinion mechanism, thereby preventing the cage from slipping.

- Without Rack Model LS

A highly corrosion resistant slide unit with an extremely small frictional coefficient.

LINEAR ROLLER & FLAT ROLLER

The LM Roller is a compact linear guide unit with high performance and a mallet type roller able to make infinite circular motions. This product is optimally applicable to machinery requiring for high positioning accuracy, repeatability and rigidity.

- Available as two variants – (1) These models have a single row of rollers and are mainly used on the flat surfaces (2) Multiple rows of rollers are arranged at 90°.

SLIDE RAIL

The Slide Rail is a low-priced limited-type linear guide made of steel plate precision-formed by rolling. This, compact and easy to install, this product is suitable for linear guides for various applications.

- Single Slide Models FBL27S, FBL27T, FBL48DR, FBL56H, FBL56H-P13, FBL56DR, FBL56DR-P13

A single linear guide unit with high rigidity and rigidity.

- Double Slide Models FBL27T, FBL48DR, FBL56H-P13, FBL56DR, FBL56DR-P13

A double linear guide unit with high rigidity and rigidity.

- Linear Type Models FBL35, FBL56/H, FBL84DR

Using a flange type that can easily be mounted, this slide-type model is capable of performing straight, finite motion.

SLIDE PACK

The Slide Pack is an inexpensive linear guide configured with the press-formed slider and roll-formed rail. It provides lightweight, compact and supple linear motion.
The Ball Screw is a high-efficiency feed screw with the ball making a rolling motion between the screw axis and the nut. Compared with a conventional sliding screw, this product has lower friction torque of one-third or less, making it most suitable for saving drive motor power.

- **DIN Standard Compliant Ball Screw Models**
  - EBA, EBC, EBP, EP, EPB

In the DIN standard compliant Ball Screw, balls under a load roll in the screw groove crossing one another on a single shaft. The nuts of the Ball Screw and the Ball Spline have dedicated support bearings directly embedded on the circumference of the nut.

- **Precision Caged Ball Screw Models**
  - SFH, SFN, SHN, SDN, SDF

A Ball Screw that achieves low noise, small torque fluctuations and long-term maintenance-free operation by using a ball cage.

- **Precision Ball Screw Models**
  - BF, BFI, DKB, DKBV, BNS, BNSF, BNT, BNSF, BNF, BNFV, BNIK, BNT, BNSF, BNTK, BNF, BNFV, BNIK, BNT, BNSF, BNTK

A Ball Screw having a screw shaft outer diameter of 4 to 25 mm and a lead of 1 to 20 mm are available as the standard.

- **Finish Shaft Ends Model BNM**

For this model, screw shafts with a screw shaft outer diameter of 4 to 25 mm and a lead of 1 to 20 mm are available as the standard.

- **Change Nut**

The Change Nut is a sliding feed screw of 45° lead angle not easily available from machining. Its large lead angle is best suited to acquiring a quick traverse mechanism at a low revolution rate.

- **Precision Ball Screw / Spline Models BNS, NS**

A single-slide type of the Change Nut is a sliding feed screw with the ball making a rolling motion between the screw axis and the nut. Compared with a conventional sliding screw, this product has drive torque of one-third or less, making it most suitable for saving drive motor power.

- **Support Unit Models EX, BK, FK, EF, FF**

The Support Unit comes in six types: models EX, BK, FK, EF, and FF, which are standardized for standard Ball Screw assembled provided with finished shaft ends, and models BN and B, which are standardized for ball screws in general. The Support Unit on the fixed rings of a JIS Class 5-compliant angular bearing provided with an adjusted preload.

- **Lock Nut Model RN**

The Lock Nut for Ball Screws is capable of easily fastening the screw shaft and the bearing with high accuracy. A loosening prevention mechanism comprising a hexagonal socket-head setscrew and a set piece prevents the Lock Nut from loosening and ensures firm-fitting.

- **Nut Bracket Models MA**

The nut bracket is standardized for standard Ball Screw assembled provided with finished shaft ends. This model is designed to be secured directly on the table using bolts. Since the height is low, it can be mounted on the table only using bolts.

- **Finished Shaft Ends Model BNM**

For this model, screw shafts with a screw shaft outer diameter of 4 to 25 mm and a lead of 1 to 20 mm are available as the standard.

- **Nut Bracket Models MA**

The nut bracket is standardized for standard Ball Screw assembled provided with finished shaft ends. This model is designed to be secured directly on the table using bolts. Since the height is low, it can be mounted on the table only using bolts.

- **Nut from loosening and ensures firm-fitting.**
All the various parts used in machine tools are made by “mother machines” that produce machine parts themselves. Whether fine and complex or massive and heavy, the manufacturing precision of parts produced by machine tools is increasing at an accelerating pace. THK’s linear motion systems help provide the guidance that makes this precision and speed possible.

EXAMPLE APPLICATIONS BY INDUSTRY

MACHINE TOOLS

- High Strength Zinc Alloy Model BL
  This model’s holder made of high strength zinc alloy is connected in perpendicular to the ball shank. With grease pockets provided on the top and bottom of the spherical area, this model achieves high lubricity and high wear resistance.
- Female Threading Holder Model RBI
  With this Link Ball model, the high strength zinc alloy is used in its holder and the mounting bolt and the holder are arranged on the same axis, allowing this model to receive both a compressive load and a pulling load. Since grease is contained in the boot, this model achieves high lubricity and high wear resistance.
- Female Threading Lubrication Model PHS
- Female Threading No Lubrication Model NIH-T
- with Male thread Lubrication Model POS
- Spherical Bearing Lubrication Model PB
- Lubrication accessories
- Cross Roller Rings
- Machinging Centres
- Milling Machines
- NC Lathes
- Pano Millsers
- CNC Hobbing Machines
- Surface Grinding Machines
- Spherical Bearing Lubrication Model PB
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GENERAL INDUSTRIAL MACHINES

- Linear Guides
- Ball screws
- LM Actuator
- Electric Actuator
- Slide Pack
- Slide Rail

TRANSPORT SYSTEMS

- Linear Guides
- Ball screws
- Change Nut

Various types of manufacturing machines are being used for automation and labour saving purposes in fields where production was previously carried out by manual labour. THK’s products are being used in this context, from devices which simply repeat the same operation accurately and efficiently to those enabling craftsmanship-like precision.

THK’s products are widely used on critical parts of railway cars, automobiles and other vehicles. In particular, in the automobile manufacturing process, THK’s products are used in almost all types of equipment, robots, processing machines, and assembling machines.
LINEAR MOTION & ROTATING PRODUCTS

APPLICATIONS

○ Dyeing Machines – LM guides, Cam Followers
○ Stone Cutters – LM guides, Lubrication accessories
○ Foam, Polyester – Processing Machines for Casting – LM guides, Ball screws, Lubrication accessories

AEROSPACE

LM Guide Model SR are used in the seat sliding mechanism of small aircraft. Because the floors in aircraft are generally made from sheet metal, measuring errors relating to mounting sections are common, and mounting can be a lengthy process. Because Model SR have excellent error absorbing capabilities, they can be mounted directly on the floor of aircraft, reducing the work required for assembly.

PRECISION INSTRUMENTS

As equipment becomes smaller and more accurate, the need for precision in the manufacturing of machine parts increases. Measuring instruments allowing higher accuracy to be maintained help to meet this need. THK products are making great contributions to the ability of precision instruments to detect very fine movements and changes.

○ Linear Guides
○ Cross Roller Guides
○ Large 3D Measuring Devices
○ Small measuring microscopes
○ Grain Inspectors

○ Cam Followers
○ Link Ball
○ Rod End
○ Lubrication accessories

ELECTRONIC DEVICES

An electronic device is a collection of small units and actuators. The manufacturing equipment for these units is also a collection of small actuators. THK supplies a wide variety of actuators to all market areas where space-saving and energy-saving actuators are continually in demand:

○ Portable TV Camera systems
○ ATMs
○ Compact Photo Development Machines

○ Linear Guides
○ Ball screws
○ Slide Rail

OTHER MANUFACTURING INDUSTRIES

Efficiently converts rotary motion to linear motion by circulating multiple balls between the screw shaft and the nut.
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