2 *TSK*
Cross Roller Slides

TSK Cross Roller Slide is a compact, high accurate linear motion guide which is heat-treated and precisely ground under strict quality control. The needs and purposes of cross roller slide are expanding for precision equipments such as optical instruments, measuring machines and precision processing equipments. We wish all customers to designate TSK cross roller slide manufactured by wealthy heat treatment and precision grinding techniques for long years.

In TSK cross roller silde TCR series, super precison rollers are alternately arranged in between precisely ground V-shaped raceway and tracking base. This enables it to receive loads in any direction and to have high rigidity, very precise, smooth linear motion. This is the most suited linear motion product where high accurate linear motion is required.
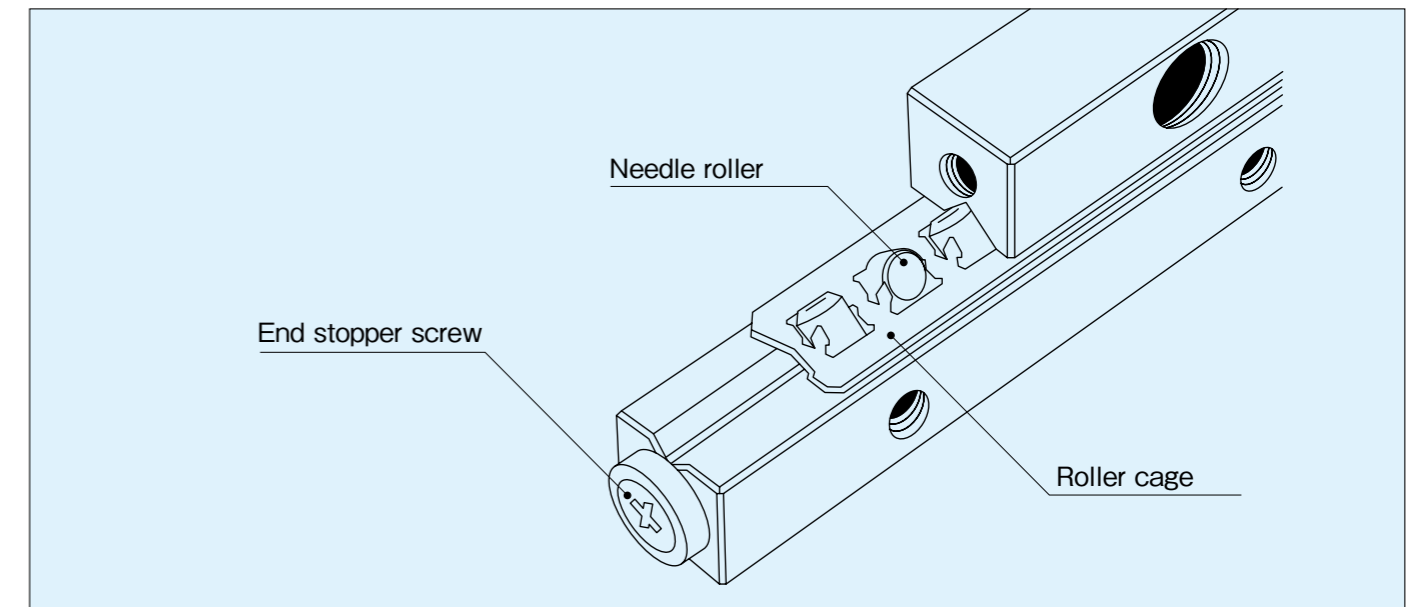
■Features

●High Rigidity

In TSK cross roller slide, super precision rollers are alternately placed in roller cage which is installed in between two V-shaped raceways. This structure enables the contact length of rollers to be greater comparing with steel balls, thus, TSK cross roller slide can keep smooth and precise linear motion without deformation under high load application.

●Smooth Linear Motion

The rollers are held separately in a cage, and retained rollers in the cage contact the surface of V-shaped raceways making a grease pocket that improves retension of lubricant. Therefore, it keeps the wear to a minimum and achieves smooth linear motion for a long time.
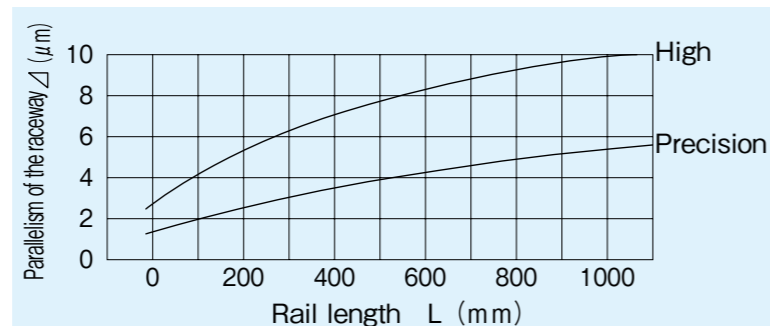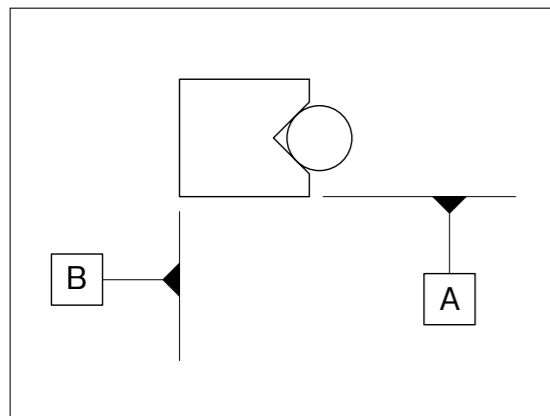
■Structure

Needle roller

End stopper screw

Roller cage

■Code Name

TCR	2	120	–	21Z	–	P
Model #	Size	Track rail overall length		Number of rollers		Accuracy grade H = High P = Precision

■Accuracy Grade

The accuracy of the rail of TSK cross roller slide is classified into high grade and precision grade as shown in figures below.

■Load rating

Direction of load	Basic load ratings	Calculation formula
C,Co	Basic dynamic load rating C（N）	$C=\left[\dfrac{Z}{2}\right]^{3/4}\times Cv$
	Basic static load rating Co （N）	$Co=\left[\dfrac{Z}{2}\right]\times Cov$

Z　: Number of roller bearings used within the effective load range
Cv ： Basic dynamic load rating per one roller　（N）
Cov: Basic static load rating per one roller　（N）

■Nominal Life

The rated life of TSK cross roller slide is calculated using the following formula.
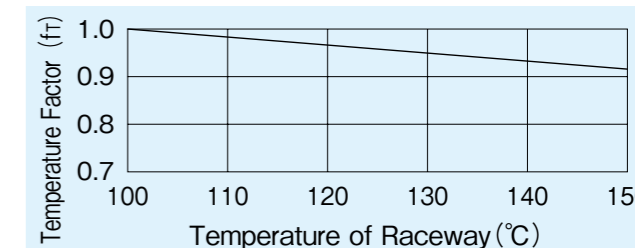
●Rated Life

$$L=\left[\frac{f_T}{f_w}\cdot\frac{C}{P_c}\right]^{10/3}\times 100$$

L ： Nominal life（km）
f_T ： Temperature factor （Fig.1）
Pc ： Applied load（N）
fw ： Load factor （Fig.2）
C ： Basic dynamic load rating （N）

f_T ： Temperature Factor
If the cross roller is used in where the operating temperature exceeds 100℃, the service life of the product is adversely affected by the high temperature. It is necessary to consider multiplying the temperature factor as shown below.
（Fig.1）

（Fig.2）　　　　　fw ： Load Factor

Operating condition	fw
Normal condition	1.0〜1.5
Running with impact	2.0〜3.0

●Service Life Time

$$Lh=\frac{L\times 10^3}{2\times \ell s\times n_1\times 60}$$

Lh ： Service life time （Hr）
ℓs ： Stroke length （m）
n_1 ： Cycles per minute （c.p.m.）