

9.6. Studying Orientation Change during Traveling

The lead accuracy of the Ball Screw equals to the positioning accuracy of the shaft center of the Ball Screw. Normally, the point where the highest positioning accuracy is required changes according to the ball screw center and the vertical or horizontal direction. Therefore, orientation change during traveling affects the positioning accuracy.

The largest factor of orientation change affecting the positioning accuracy is pitching if the change occurs in the ball screw center and the vertical direction, and yawing if the change occurs in the horizontal direction.

Accordingly, it is necessary to study the orientation change (accuracy in pitching, yawing, etc.) during traveling on the basis of the distance from the ball screw center to the location where positioning accuracy is required.

Positioning error due to pitching and yawing is obtained using the equation (39) below.

$$A = \ell \times \sin \theta \dots\dots\dots (39)$$

where

A :Positioning accuracy due to pitching (or yawing) (mm)

ℓ :Vertical (or horizontal) distance from the ball screw center (mm) (see Fig. 1)

θ :Pitching (or yawing) (°)

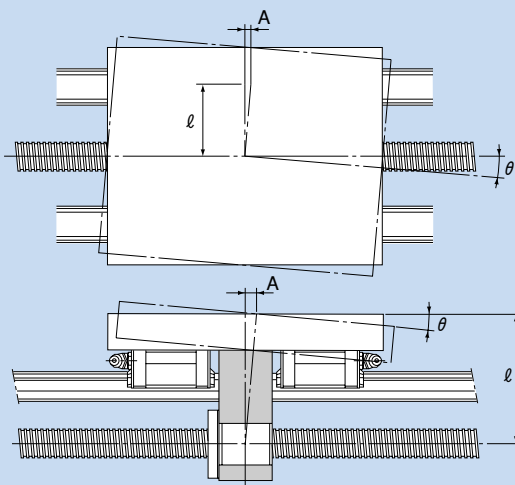


Fig. 1