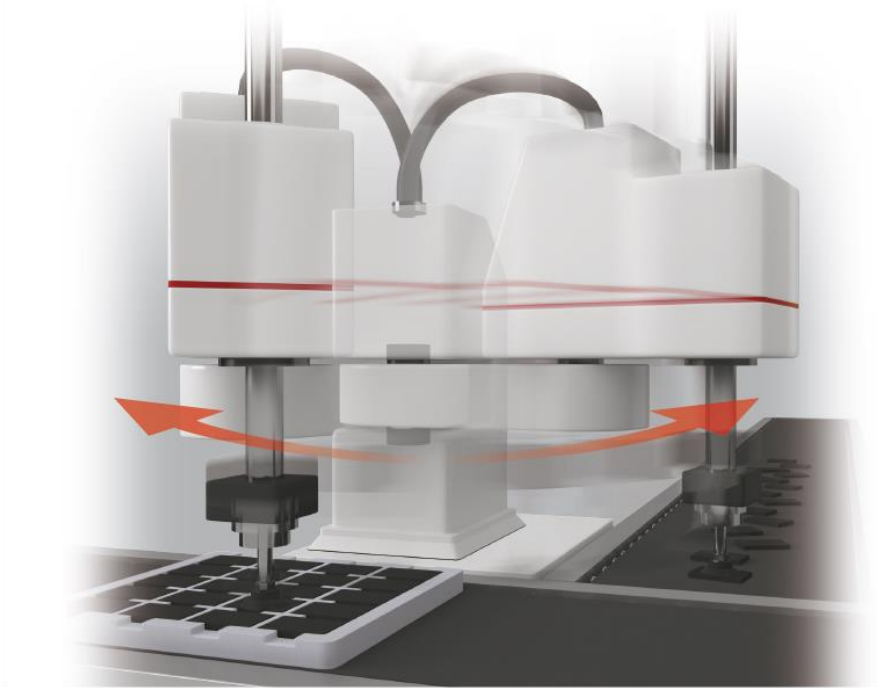
Low-Inertia Ball Screw / Spline BNS-V/NS-V

Enables high-speed motion, fast starts and quick stops.

Improves takt time of horizontal articulated robots

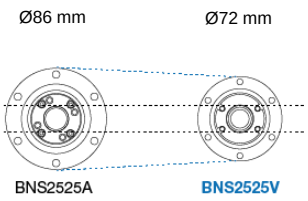
Customers are looking for low-inertia Z axes to improve the takt time of horizontal articulated robots. This product is more compact and lightweight than its predecessors, achieving low inertia and helping to optimize designs.



Lower inertial moment for improved takt times

Comparison between new model BNS-V and existing model BNS-A

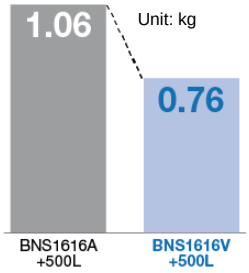
Feature 1
Up to 16% smaller



Size

The compact outer diameter enables the peripheral components of mounting devices to be smaller.

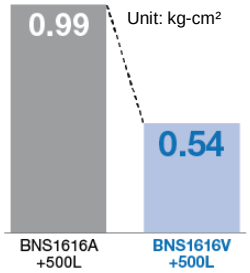
Feature 2
Up to 29% lighter



Mass

This lightweight product helps reduce the overall weight of the mounting device.

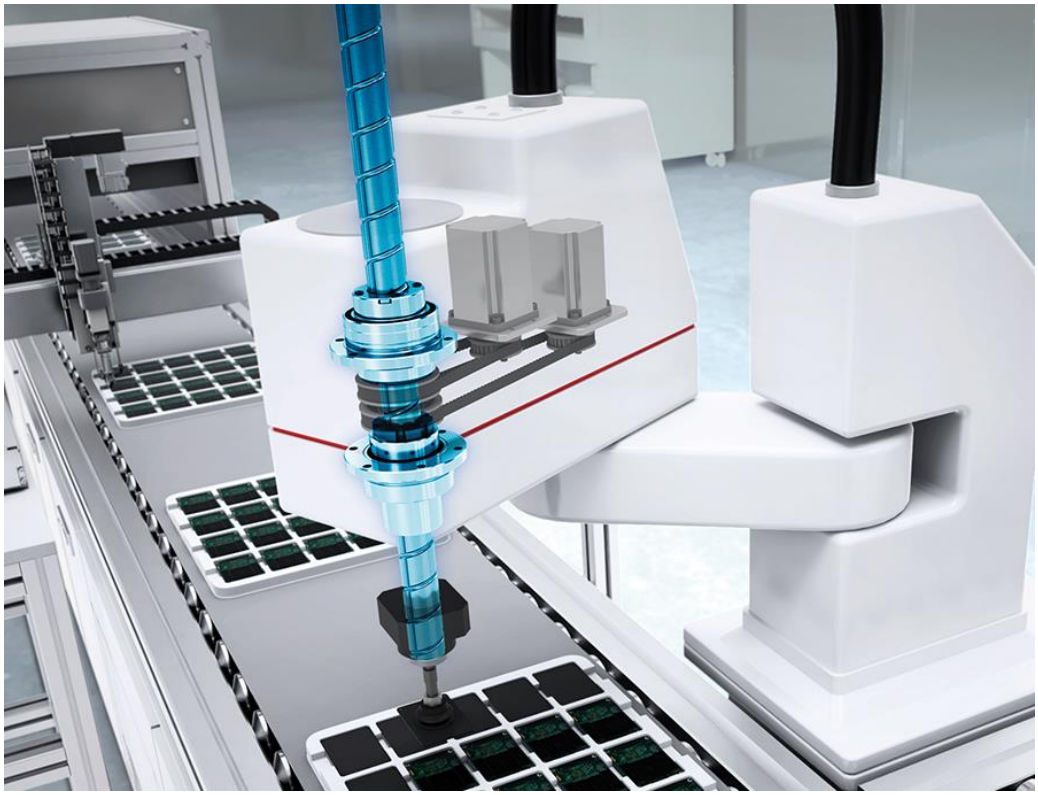
Feature 3
Up to 45% less inertia



Inertial Moment of The Nut

The reduced inertial moment of the nut makes the end shaft's vertical movements faster and smoother. It also curbs rotational torque, reducing the load put on the motor.

Provides Both Precision and Speed



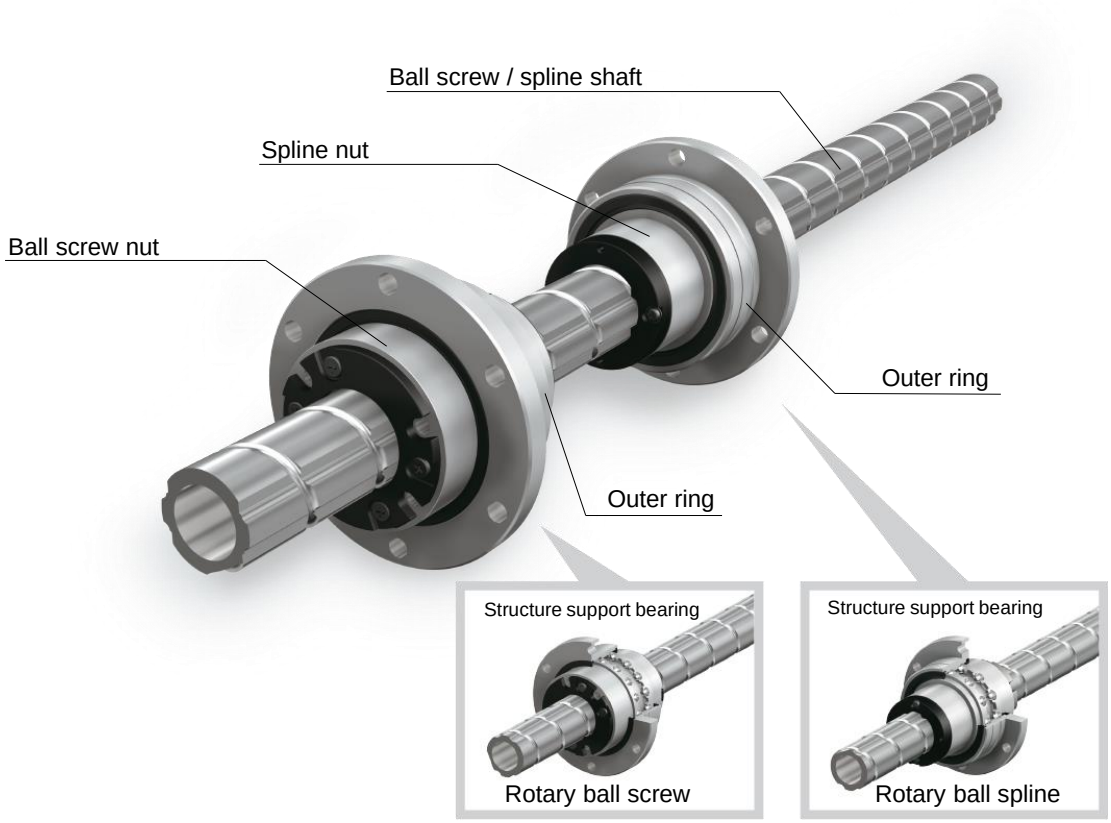
Application example: Scara- Robot

Reducing the nut's outer diameter while keeping the shaft the same size lowers the weight and can shorten takt time.

Using a smaller and lighter end shaft and peripheral device reduces the load on the motor, which reduces the amount of heat generated and enables equipment to run even longer than before.

Product Structure

The BNS-V is a combined product with a ball screw nut and ball spline nut inserted directly into the dedicated ball screw and ball spline grooves on the shaft. This ball screw/spline can perform three types of motion (rotational, linear, and spiral) with a single shaft by rotating or stopping each nut.



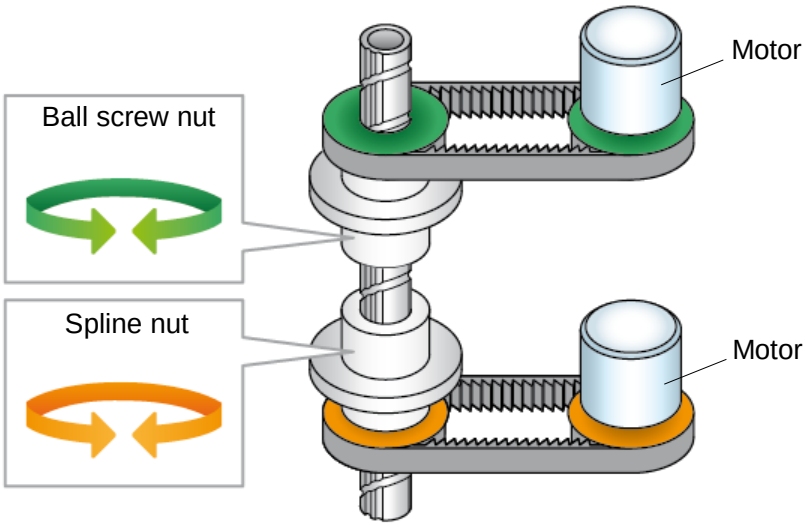
The BNS-V can perform three types of motion (rotational, linear, and spiral) with a single shaft by rotating or stopping each nut.

1. **Linear motion**
   Rotate ball screw nut → The shaft moves up and down (no rotation)

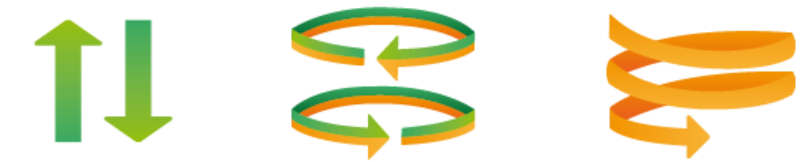
2. **Rotary motion**
   Rotate both ball screw nut and spline nut → The shaft rotates in place

3. **Spiral motion**
   Rotate spline nut → The shaft moves up and down while rotating

Mechanism of Motion



Shaft Motion



1. Linear motion
2. Rotary motion
3. Spiral motion