



Small motors for applications in mechatronics

As a representative of renowned manufacturers, Dynerics offers a wide range of rotary and linear miniature drives together with the associated control electronics in various technologies. The range is supplemented by fans and radial blowers for the cooling of equipment.



Ball screw drives

KSS is a manufacturer of ball screws and actuators (sales Dynetics), especially for miniature sizes with a shaft diameter of 16 mm or less.

Recently, KSS introduced precision rolled ball screws of the PSR/PSRT series, which achieve an accuracy of less than 0.005 mm (tolerance class/accuracy class JIS C5). They feature steel balls that provide rolling contact between the nut and lead screw, achieving a mechanical efficiency of about 90 per cent and reducing the required torque to less than one-third that of conventional lead screws. The design of the KSS ball screws also makes it easy to convert linear motion into rotary motion.

The design of the KSS ball screws also makes it easy to convert linear motion into rotary motion. Dynetics also has stainless steel rolled ball screws (SSR series) in its range. Classic rolled ball screws can achieve accuracy class Ct10 or Ct7. Ct7 achieves an axial clearance of 20 microns or less. With Ct10, an axial play of 50 micrometres or less is possible.

Dynetics has two types of lead screws in its range: the integrated version with a larger end tang (PSRT) and the fully threaded version (PSR). In the integrated end trunnion version, the fixed end trunnion can be set larger than the nominal diameter of the lead screw so that no interference fit of the sleeve is required. The profile and dimensions of the end journal are standardised so that the KSS Compact Sup-

port Unit can be installed. As the support-side end journal is unmachined, it is possible to carry out additional finishing with the thread length required by the customer. Special end journal profiles are possible as a special design.

The fully threaded version scores with a good price-performance ratio. The axial play is set to 5 micrometres or less, a play-free version (preload) is possible on request.



i Ball Screws PSR/PSRT Series

Z-Theta actuator

The Z-θ actuator based on BSSP (θ = Theta/ BSSP = Ball Screw with Ball Spline) is an integrated product that has ball screw and ball spline on the same shaft.

They are ball screws that convert rotary motion into linear motion and ball splines that move linearly while transmitting torque in rotary motion. These two elements are on the same shaft, allowing BSSP to be more compact and lighter than traditional solu-

tions with mechanical components used and arranged individually. In addition, BSSP has a drilled hollow shaft for the vacuum function.

Two types of BSSP are available: First, a design with ball spline and ball spline groove (Separate Type) placed on the same shaft but in a different area. Second, the Overlap Type carries the spline groove over the ball screw groove.

FEATURES AND BENEFITS OF THE KSS Z-THETA ACTUATOR

KSS's BSSP-based Z-Theta (Z-θ) actuators have three functions in one unit: linear motion (Z), rotary motion (Theta/θ) and vacuum (V). KSS offers three types of multifunctional Z-θ actuators: Direct, hybrid and belt drive. It is possible to select one of them according to the desired specifications or the intended application.


BELT DRIVE Z-θ MOTOR LAYOUT POSITION SHIFT DESIGN

The belt drive Z-θ actuator has the advantage that the function is added to the actuator as an additional function for mounted motors with electromagnetic brake or encoder. Nevertheless, the motor becomes larger and so does the size of the actuator housing when two motors are placed in the same phase plane. In addition, a longer BSSP shaft is required,

which has a poorer manufacturing yield, runout and more care in controlling the rotary function. As a result, the cost of the drive increases. A possible solution to this dilemma is shown by the design of the position shift of the motor layout in the following example Wafer Transfer.

APPLICATION EXAMPLE WAFER TRANSFER

An application example for wafer handling (transfer and ion implantation) in the semiconductor production process was realised with a Z-θ drive with belt drive. By using two belt-drive Z-θ actuators, which keeps the overall height of the demonstration unit low, three functions of the Z-θ actuator such as linear motion, rotation and vacuum are performed in a very limited, compact space..

 Z-θ drive BSSP0812/08




Video Wafer Transfer Demo Unit

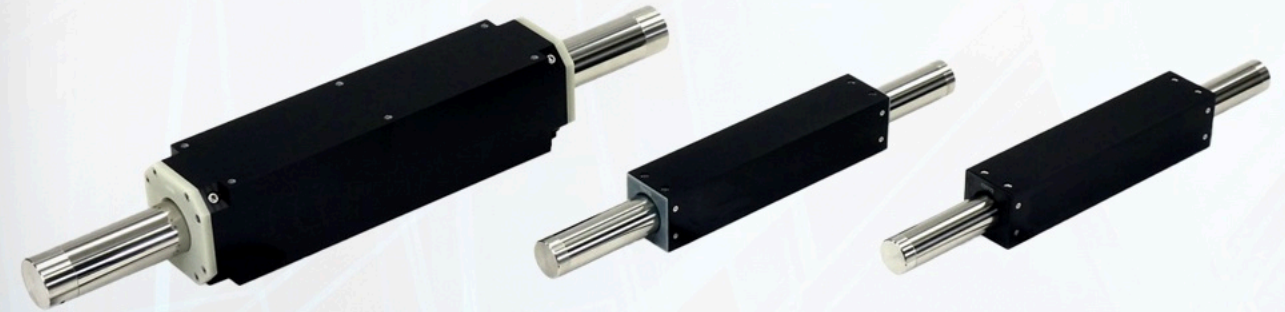
WA 3000

Compact SX060 linear servo motor

Nippon Pulse Motor (NPM), represented by Dynetics, has expanded its linear servo motor range with a very compact version. This is suitable for applications where space is limited – for example, designs with 9-millimetre pitch. The miniature linear motors

of the SX060 and SX100 series have a torque of up to 31 Nm and are free of cogging.


 Series SX 60 and SX100



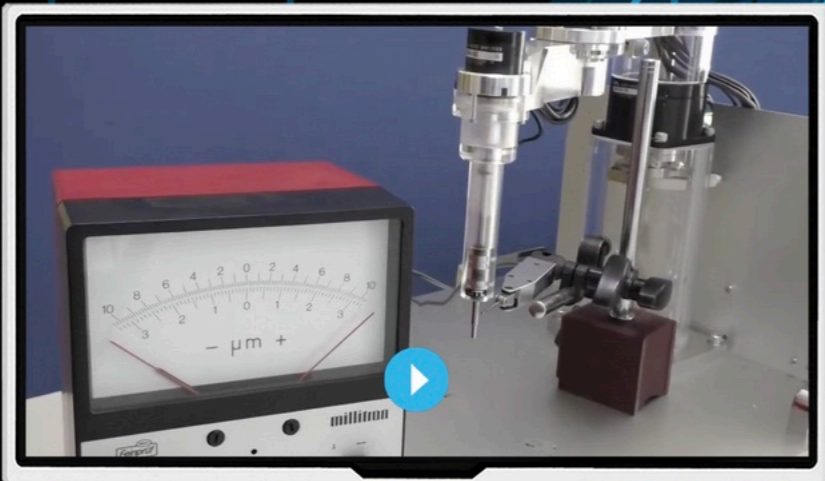
High-precision servo motors for robotic arms and cobots

Nippon Pulse's Micro Direct Drive (MDD) series of brushless motors are available in flange sizes from 13 mm to 70 mm in three lengths. The servo motors are suitable for use in high-precision cleanroom equipment such as scara, pharmaceutical robots and small gantry. They can also be used in industrial robot arms for cobots, articulated robots for production lines with complex assembly operations in harsh conditions and in precision machines such as SMA

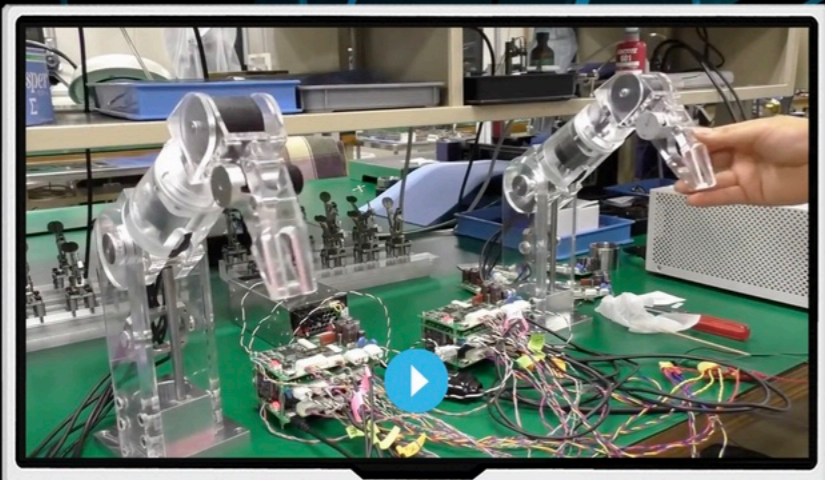
devices for semiconductor manufacturing. With the high-resolution integrated encoder (absolute or incremental), precise positioning solutions can be realised. On request, motors from the MDD series can be supplied with a hollow axis. Customer-specific adaptations, e. g. special seals, are possible.

 Overview Micro Direct Drive series





Video: Micro Direct Drive Motor Miniature AC servomotor in a scalar robot with the repeatability of $\pm 1\mu\text{m}$



Video: Micro Direct Drive Motor Miniature AC servomotor Robotic arm Master slave demonstration (NPM)



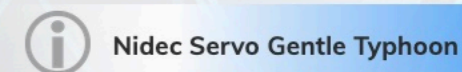
Video: Torque demonstration Lifts a weight by a gearless Micro Direct Drive Motor Miniature AC servomotor



Quiet, energy-saving fans

The Gentle Typhoon fans are 5 dB quieter than conventional fans and, with an installation depth of 25 millimetres, offer the same air performance as 32-millimetre fans. The 7 millimetres saved allow the designer to reduce air resistance, increase airflow and improve cooling efficiency. Thanks to its driver ICs, the new high-efficiency brushless motor offers an energy-saving potential of around 30 percent. In addition, these fans can – depending on the customer –

be equipped with speed sensors. The D1225R series from the manufacturer Nidec is new. It is low noise, has a high air flow and has IP68 protection. PWM control is available as an option. Thanks to its dust- and waterproof design, it is suitable for applications in harsh environments.



Dynetics at the SPS in Nuremberg

Dynetics will be presenting a range of interesting products at its stand (Hall 4, Booth 490) at SPS in Nuremberg from 14 to 16 November 2023.

Design examples and live demos will give an impression of the many possibilities of linear drives, servo motors, motion controllers and other components

from the Dynetics portfolio. Particularly interesting will be the live demo with the SX060 linear servo motor.

A reference design for computer-controlled pipettes with eight simultaneous channels will be shown. The entire system is controlled by the FMAX compact controller and the hybrid module Commander with the Arcus CRX-8 driver.

IN FOCUS: NEW DRIVES FROM THE MANUFACTURER ELRA

- Closed-loop stepper motor platform with field-oriented motor control in sizes NEMA 23, NEMA 24 and NEMA 34.
- New generation of complete drives for difficult environmental conditions. It can now be configured up to IP67 and is expected to be on the market from the first quarter of 2024.
- Brushless bevel geared motor for applications with tight spaces where 90° force redirection is required.
- IP65 high-torque BLDC motors with rated speeds of 700–800 rpm and continuous torques up to 5.5 Nm. The absence of a gearbox enables, among other things, backlash-free positioning and quiet operation.
- New traction drives for autonomous AGVs/shuttles impress with their enormous flexibility in terms of performance and installation space and can be easily integrated.



Find out more now!

- Homepage Dynetics
- Ball screws PSR/PSRT series
- Z-θ drive BSSP0812/08
- Video Wafer Transfer Demo Unit
- Series SX 60 and SX100
- Overview Micro Direct Drive series
- Brushless bevel gear motor
- IP65 High-Torque BLDC motors
- Traction drives for autonomous AGVs/shuttles
- Nidec Servo Gentle Typhoon
- Video: Micro Direct Drive Motor Miniature AC servomotor in a scalar robot with the repeatability of $\pm 1\mu\text{m}$
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- Video: Torque demonstration Lifts a weight by a gearless Micro Direct Drive Motor Miniature AC servomotor
- Request info

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smart production solutions

Nuremberg, November 2023, 14-16

Hall 4, Booth 490