Oriental motor

αSTEP

Hybrid Control System: αSTEP

Position, Speed and Torque Control

More Accurate Operation with

Automatic Switching Between Open Loop and Closed Loop Control

High Response with No Hunting or Tuning

What is αSTEP?

αSTEP is a "hybrid" stepper motor-based motor & driver that together, performs independent control which combines the advantages of "open loop" and "closed loop" performance. In addition to high-accuracy positioning and speed control, it can perform control that restricts the motor's generated torque to a user set value (such as push-motion operation).

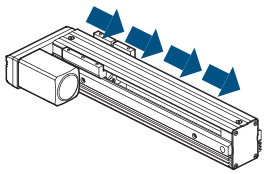
Hybrid Control System

The hybrid control system constantly monitors the motors position allowing for the benefits of performance from "open loop" control while providing the assurance of "closed loop" performance.

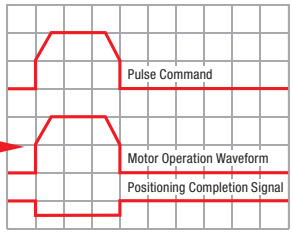
Normal Condition (Positioning deviation is less than ±1.8°)

Motor is controlled in open loop mode like a stepper motor.

- The tuning-free feature allows for high accuracy and high responsiveness to commands
- Hunting-free (Complete stop)
- Constant monitoring of the motor's status



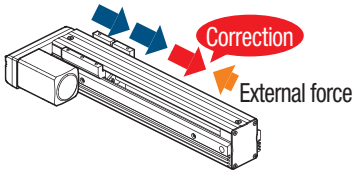
No time lag between command and actual operation



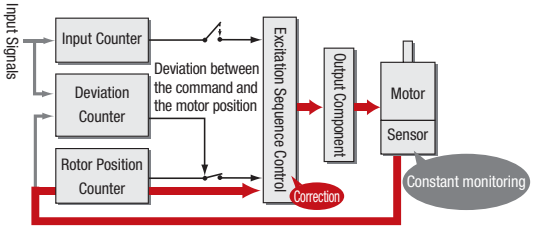
Overload Condition (Positioning deviation is ±1.8° min.)

The closed loop mode is engaged to maintain the positioning operation.

Reliability as a result of monitoring and correction of positions and speed

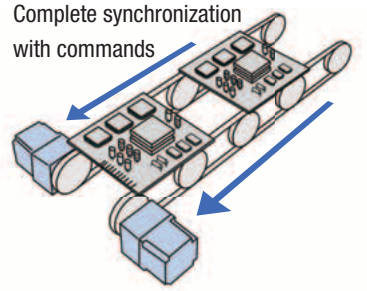


●Closed Loop Control System

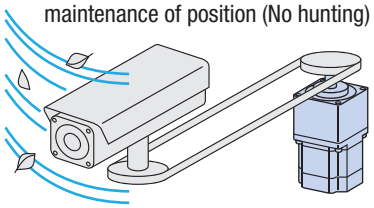


Ideal Applications for αSTEP

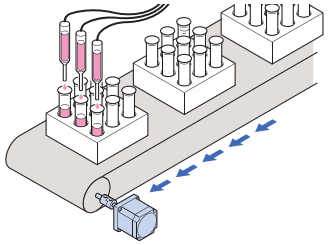
Complete synchronization with commands



Complete stop during standby and maintenance of position (No hunting)



Frequent repetitive starting and stopping



Hybrid Control System

Accurate Motion, Constant Monitoring with Position Correction

Common Platform with Motor, Drives, Gears and Actuators

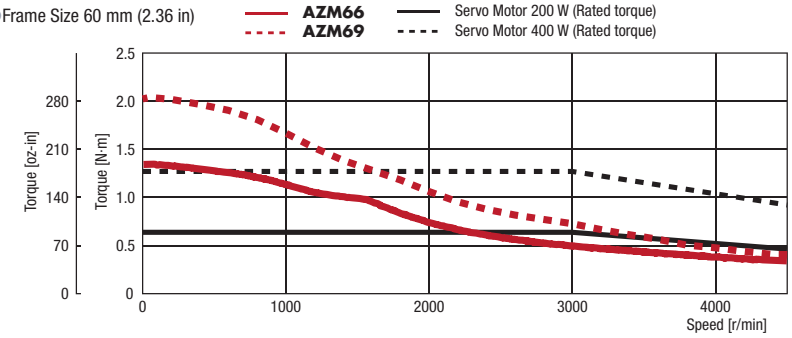
Features of αSTEP

What is the Output of αSTEP?

"Rated output" is not listed because αSTEP has no "rated speed." Refer to the graph on the right to compare rated torque of αSTEP to watts of servo motor's rated output torque.

- Generates high torque in the mid-to-low speed range
- Excels at frequent starting and stopping operation that requires acceleration/deceleration torque

● Frame Size 60 mm (2.36 in)

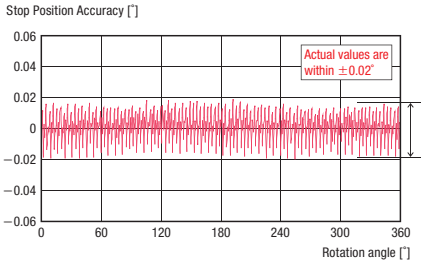


● Data for the speed–torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

What is the Stopping Accuracy of αSTEP?

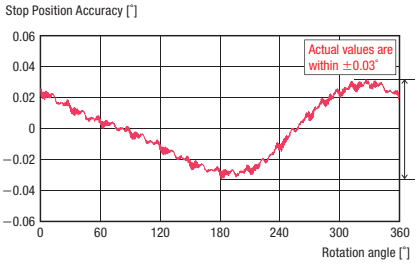
The stopping accuracy of a typical αSTEP is ±0.05° (under no load), which is equivalent to that of servo motors. The graphs on the right side show the actual measured stopping accuracies when an αSTEP and an AC servo motor were rotated once.

● Stopping accuracy of αSTEP (Actual measurements)

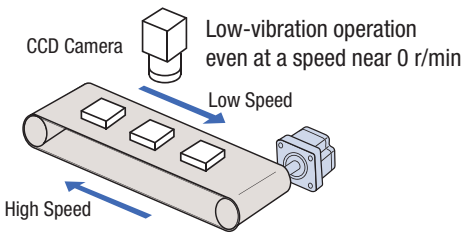


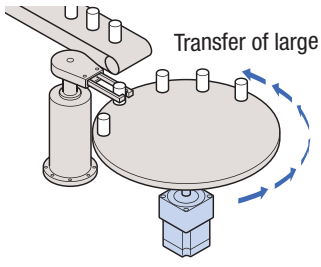
[Example] When the ball screw lead is 10 mm, the αSTEP stopping accuracy is ±1.4μm and the repetitive positioning accuracy of a common ground ball screw is ±10μm.

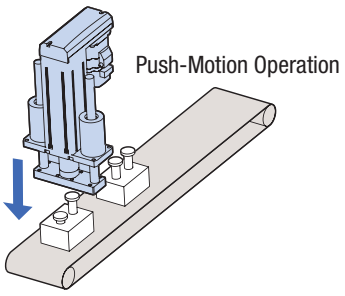
● Stopping accuracy of AC servo motor with a common 20-bit encoder (Actual measurements)



The stopping accuracy of an AC servo motor is the encoder resolution ±1 pulse*. The above shows the actual values that result from differences in the encoder's assembly.
*1,048,576 p/rev at 20 bits







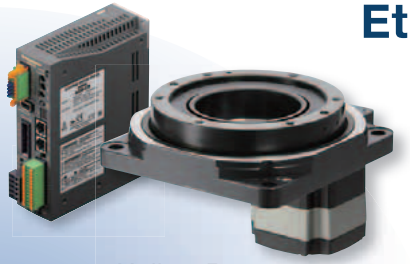
Product Variation with the **AZ** Series

Controllability is consolidated across all product groups that contain the **AZ** Series.

AZ Series Now With:

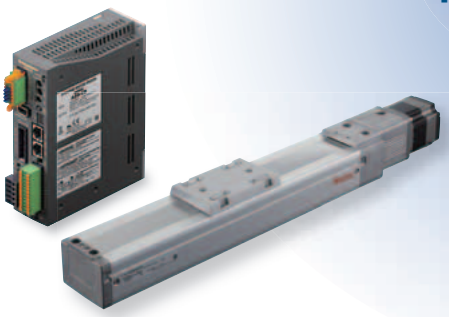
EtherNet/IP®

Battery-Free
Absolute Sensor
AZ Series



Hollow Rotary
Actuator
DGII Series

Simplify Setup & Control



Motorized Linear Slides
EZS Series

Motorized Cylinders
EAC Series

Rack and Pinion
L Series

EtherNet/IP™ is a trademark of ODVA, Inc.

Specifications are subject to change without notice. This catalog was published in July, 2019.

ORIENTAL MOTOR U.S.A. CORP.

Western Sales and Customer Service Center
Tel: (310) 715-3301 Fax: (310) 225-2594

Los Angeles
Tel: (310) 715-3301

San Jose
Tel: (408) 392-9735

Seattle
Tel: (425) 214-7559

Midwest Sales and Customer Service Center
Tel: (847) 871-5900 Fax: (847) 472-2623

Chicago
Tel: (847) 871-5900

Dallas
Tel: (214) 432-3386

Toronto
Tel: (905) 502-5333

Eastern Sales and Customer Service Center
Tel: (781) 848-2426 Fax: (781) 848-2617

Boston
Tel: (781) 848-2426

Charlotte
Tel: (704) 766-1335

New York
Tel: (973) 359-1100

Technical Support
Tel: (800) 468-3982 / 8:30 A.M. to 5:00 P.M., P.S.T. (M–F)
7:30 A.M. to 5:00 P.M., C.S.T. (M–F)
E-mail: techsupport@orientalmotor.com

Obtain Specifications, Online Training at:
www.orientalmotor.com

This printed material uses ECF (Elemental Chlorine Free) paper and vegetable oil based inks. This combination is environmentally friendly.

Printed in USA 19UC 0.70 #515 B