

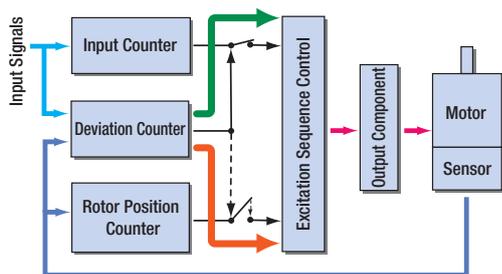
# Overview of Stepping Motor and Driver Packages $\alpha$ STEP

The  $\alpha$ STEP utilizes Oriental Motor's unique closed loop control. This is a motor and driver package offering the user-friendliness of a stepping motor with improved response and reliability.

## Overview and Features

- High Reliability by Closed Loop Control
- ◇ Maintains Operation Even During Abrupt Load Fluctuations and Accelerations

It operates synchronously with commands using open loop control during normal conditions. In an overload condition, it changes immediately to closed loop control to correct the position.



**Normal Condition**

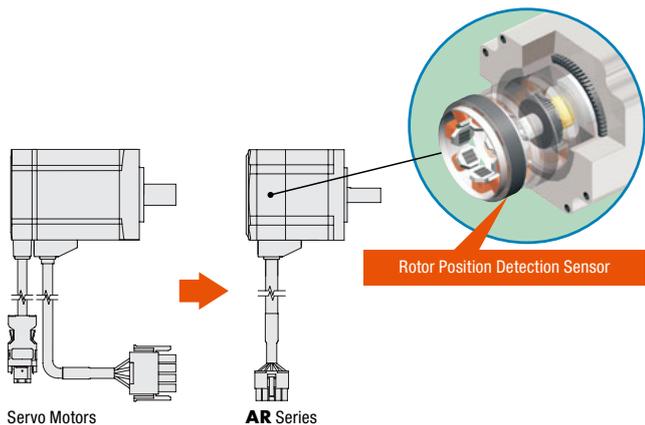
Motor runs in open loop mode like a stepping motor.

**Overload Condition**

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

### ◇ Adoption of a Rotor Position Detection Sensor (Resolver)

- Because the sensor is compact and slim, the overall length of the motor has been reduced.
- Performance such as heat resistance and vibration resistance is better than with regular optical encoders.
- Because an encoder cable is not necessary, the motor and driver can be connected with just 1 cable.



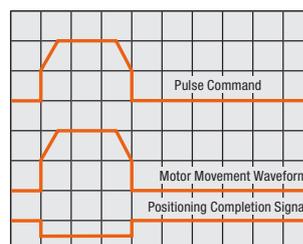
### ◇ Alarm Signal Output in Case of Abnormality

If an overload is applied continuously, an alarm signal is output. When the positioning is complete, an END signal is output. This ensures the same level of reliability achieved by a servo motor.

- Unique Advantages of Stepping Motors
- ◇ Excellent Synchronization, High-Response Operation
- Frequent Starting and Stopping is Possible

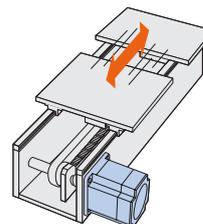
Stepping motors operate synchronously with pulse commands and generate high torque with a compact body, and offer excellent acceleration performance and response.

They are ideal for applications requiring frequent starting and stopping.



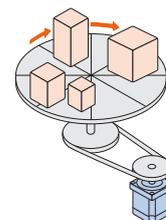
### ◇ No Tuning

Positioning is still possible without gain tuning even when the load fluctuates due to use of a belt mechanism, cam or chain drive, etc.



### ◇ Holding the Stop Position

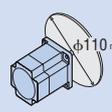
During positioning, the motor stops with its own holding torque without hunting. Accordingly, stepping motors are ideal for applications where the low rigidity of the mechanism requires absence of vibration upon stopping.



### ◇ Capable of Driving Large Inertial Loads

Compared with a servo motor of the same size, a larger inertial load can be driven regardless of speed conditions.

- Comparison at 30 times of the rotor inertia

	 $\phi 169$ mm	 $\phi 110$ mm
Motor Type	<b>AR Series</b>	Servo Motor (Conventional)
Motor length (Frame size 60 mm)	90 mm	96.5 mm
Load Inertia (30 times the rotor inertia)	$22.4 \times 10^{-4}$ kg-m <sup>2</sup>	$4.0 \times 10^{-4}$ kg-m <sup>2</sup>
Diameter of Load Inertia (Thickness: 10 mm, Material: Aluminum)	169 mm	110 mm