Compact Linear Actuators

DRS2 Series α_{STEP} AZ Equipped

<Additional Information>
● Technical reference ➜ Page H-1
● Regulations & Standards ➜ Page I-2

CE

● For detailed information about regulations and standards, please see the Oriental Motor website.

Type with a Guide
Built-in Controller

Type without a Guide
Pulse Input

The **DRS2** Series uses the α_{STEP} **AZ** Series equipped with the Absolute Sensor for the driving motor. The Absolute Sensor is a mechanical multi-turn Absolute Sensor, so an external sensor is not required. The **DRS2** Series helps to save space and reduce wiring, as well as offer a more compact and lightweight design for the equipment.

- Optimized for Providing Micromovements and High Positioning Accuracy
- Reduces Startup Time
- Saves Space and Reduces Wiring with the Absolute Sensor
- Highly Efficient Push-Motion Operation

FLEX What is FLEX?

FLEX is the collective name for products that support I/O control, Modbus (RTU) control, and FA network control via network converters.
These products enable simple connection and simple control, shortening the total lead time for system construction.

Features

Perfect for Micromovements and High Positioning Accuracy

●The Product Integrates a Stepper Motor with a Ball Screw

The hollow rotor and ball screw nut have been integrated. Since no connecting parts are necessary, there is less backlash than when coupling rigidity, etc. combines other parts, and highly accurate positioning can be achieved.

●Driven by Ground Ball Screw or Rolled Ball Screw

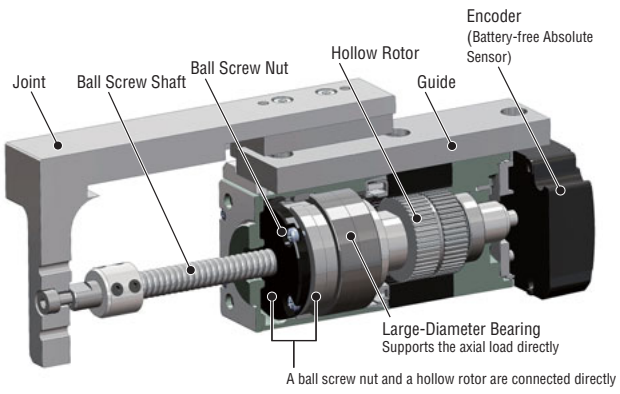
[Min. Traveling Amount]
0.001 mm
[Repetitive Positioning Accuracy]
Ground ball screw: ±**0.003** mm Rolled ball screw: ±**0.01** mm

●High Transportable Mass and High Speed are Achieved

● Type with a Guide
[Maximum Transportable Mass]
- Horizontal direction: **10** kg (Lead 2 mm), **5** kg (Lead 8 mm)
- Vertical direction: **10** kg (Lead 2 mm), **5** kg (Lead 8 mm)

[Maximum Speed]
50 mm/sec (Lead 2 mm), **200** mm/sec (Lead 8 mm)

Stroke **40** mm



● Absolute Sensor
This is the battery-free mechanical multi-turn absolute sensor.
The inclusion of this compact and low-cost absolute system saves space and wiring, because a home sensor is not required.

Startup Time Reduced

Compact Body Houses Entire Linear Motion Mechanism

- Since customers do not need to provide parts, the time needed for installing, designing, and selecting parts can be reduced.
- The number of man-hours required for assembly and adjusting the installation accuracy can be reduced, contributing to higher productivity.

Parameters Set at Operation

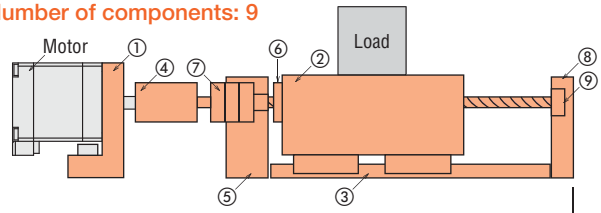
[Min. Traveling Amount]
Built-in Controller Type: 0.001 mm
Pulse Input Type : 0.001 mm/step

Comparison of the Number of Components

Configuration examples of cases where the load is driven by the same stroke

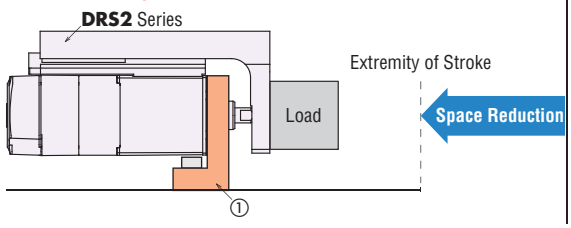
◇**If Made by Customers**

Number of components: 9



◇**DRS2 Series, Using the Guide Type**

Number of components: 1

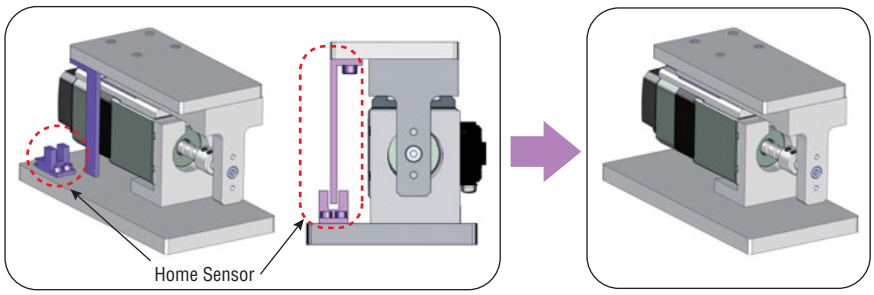


[Parts Used] ①Installation plate ②Transportation table ③Linear guide ④Coupling ⑤Fixed-side block ⑥Ball screw ⑦Fixed-side bearing ⑧Support-side block ⑨Support-side bearing

Space Saving and Less Wiring with the Absolute Sensor

In addition to the compact and lightweight body, the motors with absolute sensors do not require a home sensor. This saves space and wiring, and lets you avoid routine maintenance or trouble caused by using a home sensor.

Application Example

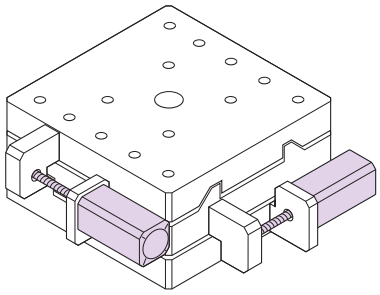


When the Home Sensor is Attached

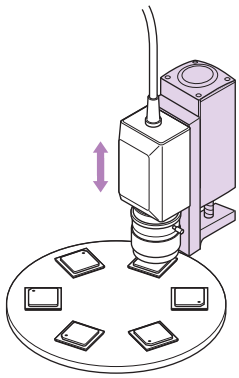
When the Home Sensor is Not Attached

Typical Applications

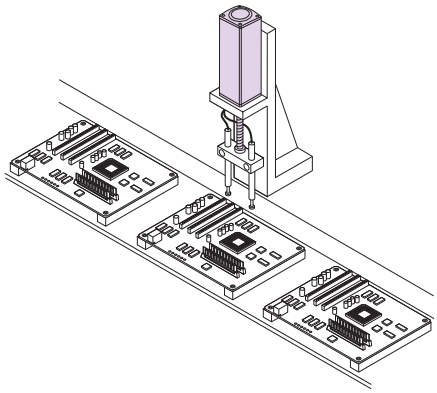
Driving an X-Y Stage
(Automated micrometer head)



Focusing of a CCD Camera



Vertical Movement of Probes



Efficient Push-Motion Operation

●Flexible Pushing Force and Timing

The **DRS2** Series can easily perform a push-motion operation after a positioning operation. Also, the pushing force and timing are adjustable.

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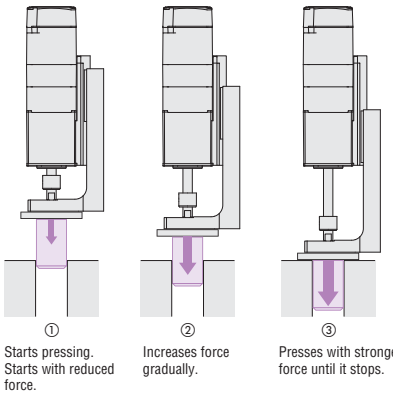
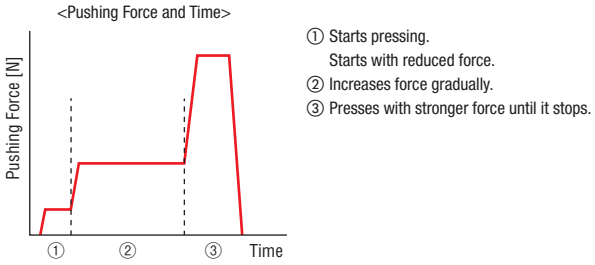
- You can set the pushing force and push timing to an operation data No., and then select the data No. to change the settings.
- There are different ways to change the pressing phases, such as dropping the force so that the position does not shift, slowly increasing the force, or rapidly increasing the force.





●Pressing at Low Speed

The motor can approach the load at high speed. The motor decelerates just before hitting the surface at low speed.

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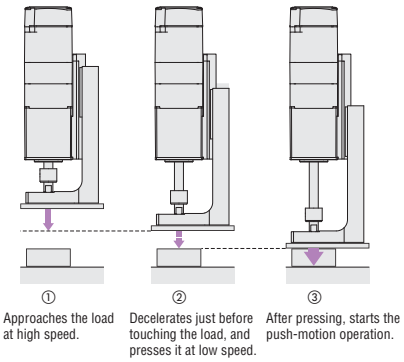
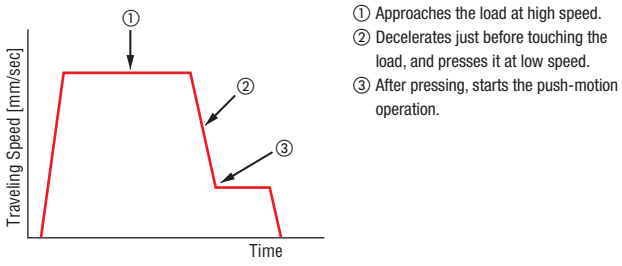
- Since the pressing impact is minimal, a mechanism for shock absorption is not required.
- The motor can approach at high speed just before reaching the surface, thus reducing the takt time.





●Push-Motion Operation with Pulse Input Type

When T-MODE input is set, push-motion operation is possible, without the overload alarm for the pulse input type being generated. This is useful for push-motion operation while using pulse signal control.

Newly Developed Absolute Sensor

Oriental Motor has developed a compact, low-cost, battery-free mechanical type absolute sensor (patented). This can help improve productivity and reduce costs.

Mechanical-Type Sensor

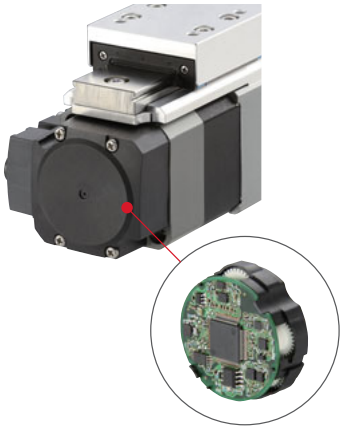
A mechanical sensor composed of multiple gears is employed. Positioning information is detected by recognizing the angle of the individual gears.

Multi-turn absolute sensor

Absolute position detection is possible with ±900 rotations (1800 rotations) of the motor shaft from the reference home position.

Home Setting Method

The home position can be easily set by pressing a switch on the driver's surface, which is saved by the Absolute Sensor.
In addition, home setting is possible with the data setting software (**MEXE02**) or by using an external input signal.



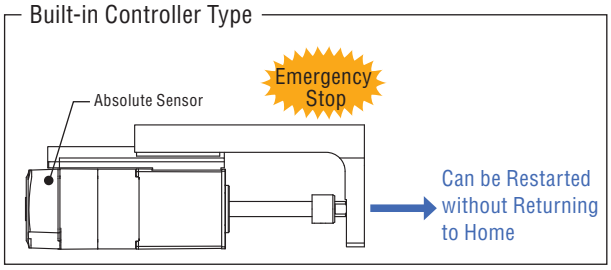
Battery-free Absolute Sensor

Battery-free

No battery is required thanks to a mechanical-type sensor. Positioning information is managed mechanically by the absolute sensor.

Holding Positioning Information

Even if the power shuts down during a positioning operation or the cable between the actuator and the driver is disconnected, the positioning information is retained. With the built-in controller type, you can restart the positioning operation, without performing return-to-home after an emergency stop on the production line or a blackout.



Reduced Maintenance

Because there is no battery that needs replacing, maintenance time and costs can be reduced.

Unlimited Driver Installation Possibilities

Because there is no need to secure space for battery replacement, there are no restrictions on the installation location of the driver, improving the flexibility and freedom of the layout design of the control cabinet.

Safe for Overseas Shipping

Normal batteries will self-discharge, so care must be taken when the equipment requires a long shipping time, such as when being sent overseas. The Absolute Sensor does not require a battery, so there is no limit as to how long the positioning information is maintained. In addition, there is no need to worry about various safety regulations, which must be taken into consideration when shipping a battery overseas.

No External Sensors Required

With the use of the absolute system, external sensors such as the home sensor and the limit sensor are not needed.

High Speed Return-to-Home

Because return-to-home is possible without using an external sensor, return-to-home can be performed at high speed without taking the specifications for sensor sensitivity into account, allowing for a shortened machine cycle.

Reduced Cost

Sensor costs and wiring costs can be reduced, allowing for lower system costs.

Simple Wiring

Wiring is simplified, and the degree of freedom for equipment design is increased.

Not Affected by External Sensor Malfunctions

There is no need for concern about sensor malfunctions, sensor failures, or sensor wire disconnections.

Improved Return-to-Home Accuracy

Home position accuracy is increased because the return-to-home operation is performed regardless of any variations in home sensor sensitivity.

- If no limit sensor is installed, movements that exceed the limit values can be avoided through the use of the limits in the driver software.

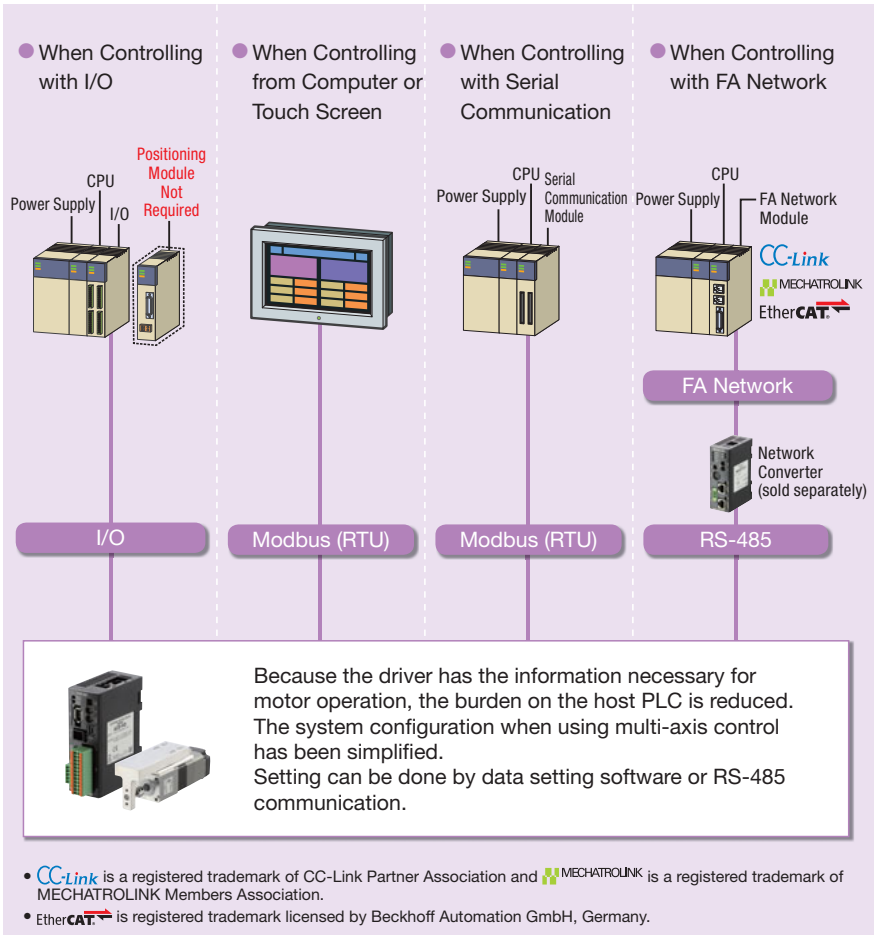
2 Driver Types Available to Match the System Configuration

Built-in Controller Type FLEX

With this type, the operating data is set in the driver, and is then selected and executed from the host system. Host system connection and control are performed with any of the following: I/O, Modbus (RTU), RS-485, or FA network. By using a network converter (sold separately), CC-link, MECHATROLINK or EtherCAT communication are possible.

FLEX

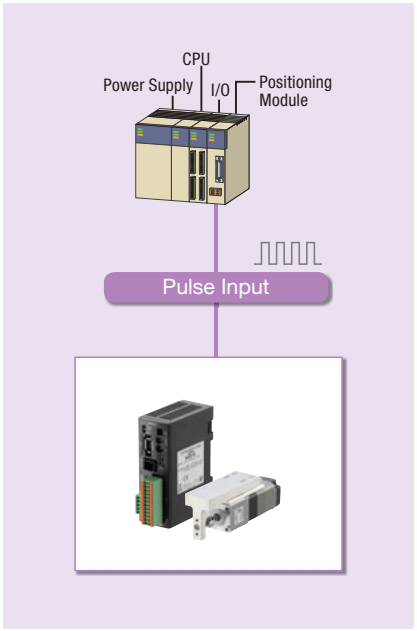
FLEX is the collective name for products that support I/O control, Modbus (RTU) control, and FA network control via network converters. These products enable simple connection and simple control, shortening the total lead time for system construction.



- CC-Link is a registered trademark of CC-Link Partner Association and MECHATROLINK is a registered trademark of MECHATROLINK Members Association.
- EtherCAT is registered trademark licensed by Beckhoff Automation GmbH, Germany.

Pulse Input Type

This type executes operations by inputting pulses into the driver. It controls the motor using a positioning module (pulse generator).

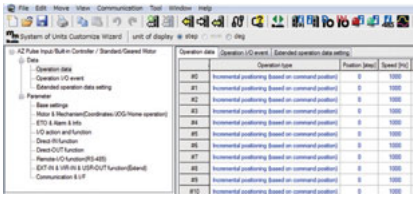


Set and Operate Easily from a PC

By using the data setting software **MEXE02**, data setting, saving, actual operation, and confirmation via each monitor function can be performed easily on a computer. The data setting software **MEXE02** can be downloaded from the website.

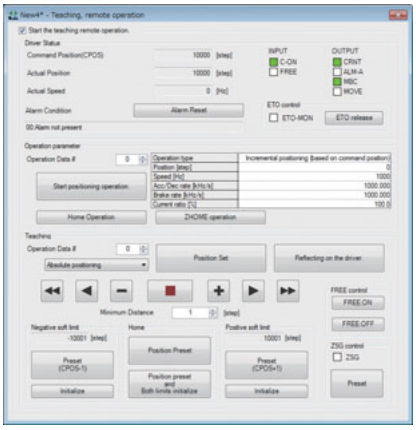
●Operating Data/Parameter Settings

You can easily set and save the operating data and parameters on a computer. And then by forwarding the saved data when you replace the driver, etc. the settings will be the same.



●Teaching and Remote Operation

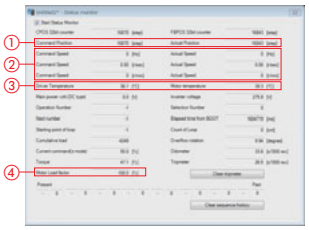
Data setting software can be used to drive the motor. This can be used for teaching or test drive purposes.



●Status Monitor

In addition to being able to monitor the speed, motor, driver temperature, and load factor during operations, the integrating rotation amount, etc. can be monitored from the start of use. The signal for each item can be output at your discretion, which leads to effective maintenance.

① Detects the actual position in comparison to the command position.
② Detects the actual speed in comparison to the command speed.
③ Detects the temperature of the motor encoder section and inside the driver.
④ With the output torque of the motor speed at 100%, the current load factor can be displayed.



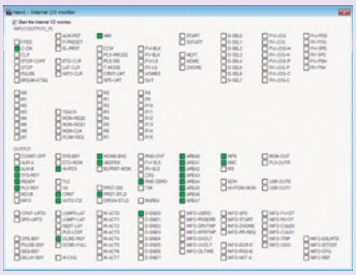
●Multi-Monitoring Compatible

Multi-monitoring enables remote operation or teaching while monitoring.

Various Monitoring Functions

●I/O Monitoring

The status of the I/O wired to the driver can be checked on a computer. This can be used for post-wiring I/O checks or I/O checks during operation.

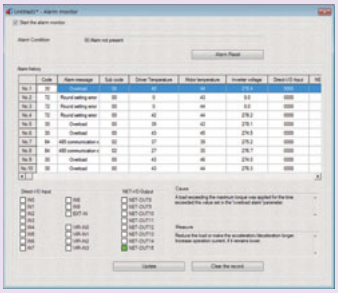


●Waveform Monitoring

The operating status of the motor (such as command speed and motor load factor) can be checked from an oscilloscope-like image. This can be used for equipment start-up and adjustment.

●Alarm Monitoring

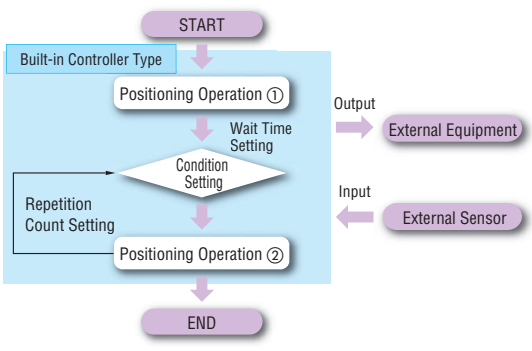
When an abnormality occurs, the details of the abnormality and the solution can be checked.

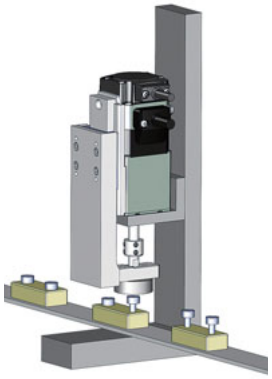


Simplified Program with Simple Sequence Functions (Available only on the built-in controller type.)

For built-in controller types, you can simplify the sequence control program by incorporating output signals for controlling other devices or external input signals from sensors.

- Number of Positioning Operation Data Sets (Up to 256)
- General-Purpose I/O Signal Counts (Input 9, Output 6)
- Communication I/O Signal Counts (Input 16, Output 16)





Standardized Wiring, Control, and Maintenance Parts

Various mechanical components equipped with **αSTEP AZ** Series are available.
Wiring, control, and maintenance parts have been standardized, since the same motors and drivers are equipped, which reduces the startup time and simplifies operation.

Battery-Free, Absolute Sensor Equipped
αSTEP AZ Series

αSTEP AZ Series Equipped

Electric Linear Slides **EZS** Series

Electric Linear Slides **EAS** Series

Electric Cylinders **EAC** Series

Compact Linear Actuators **DRS2** Series

Hollow Rotary Actuators **DGII** Series

Merits of Standardization

Wiring Standardization
Labor used for electrical design and wiring can be saved, since the I/O pin assignment is the same.

Control Standardization
These products can be operated via the same method, since the control method is the same. For the network control, the remote I/O and the command code are also the same. The labor of making the program can be eliminated.

Maintenance Parts Standardization
Maintenance parts can be minimized, since the motor, driver, and cable are common to all. Management costs (parts cost, management space) can be reduced.

Various Combinations Available

For the **DRS2** Series, compact linear actuators, drivers, or connection cable sets need to be ordered separately.
They can be purchased in various combinations.

Compact Linear Actuators							Driver (24 VDC/48 VDC)	Connection Cable Sets
Configuration		Frame Size	Stroke	Ball Screw Type	Lead (mm)	Cable Direction		
With Guide	● Without Electromagnetic Brake  ● With Electromagnetic Brake 	42 mm	40 mm	Rolled	2	Right/Left	● Built-in Controller Type 	● Without Electromagnetic Brake  For Motor For Encoder
					8			
				Ground	2			
Without Guide	● Without Electromagnetic Brake  ● With Electromagnetic Brake 			Rolled	2	–	● Pulse Input Type 	● With Electromagnetic Brake  For Motor For Encoder  For Electromagnetic Brake
					8			
				Ground	2			